DRAFT

REMOVAL ACTION WORKPLAN
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA
DOCKET NO.: HSA-CO 01/02-154

CONSENT ORDER RESPONDENT:
HEARTHSIDE RESIDENTIAL CORP.

PREPARED BY:

UNITED STATES

Department of the Interior
U.S. Fish and Wildlife Service

and

STATE OF CALIFORNIA

Department of Toxic Substances Control

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15 October 2004

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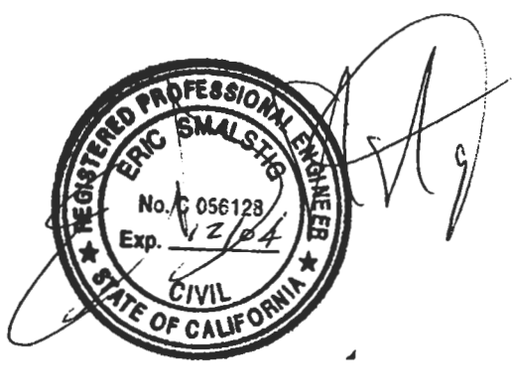
This Remedial Action Workplan (RAW) was prepared by the staff of the United States Fish and Wildlife Service and the Department of Toxic Substances Control. The Project Engineer for the Fieldstone Property subsequently reviewed this RAW. The Project Engineer's signature appears below. By signing this page, the Project Engineer acknowledges that he reviewed the general information and plans presented in this RAW.

Appendices B, C, and D to this RAW were prepared by the staff of GeoSyntec Consultants under the supervision of the Project Engineer. The findings or professional opinions in this RAW and its appendices were prepared in accordance with generally accepted professional engineering and geologic practice. No attempt to verify the accuracy of the data provided by third parties was made. No warranty is expressed or implied.



Date: 15 OCT 04
Eric D. Smalstig, P.E.

FIELDSTONE PROPERTY
DRAFT REMOVAL ACTION WORKPLAN

TABLE OF CONTENTS

Page

TABLE OF CONTENTS (continued)

Page

TABLE OF CONTENTS (continued)

TABLE OF CONTENTS (continued)

ABBREVIATIONS AND ACRONYMS

ARARs	Applicable or Relevant and Appropriate Requirements
ATSDR	Agency for Toxic Substances Disease Registry
CCR	California Code of Regulations
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
DTSC	Department of Toxic Substances Control
HSP	Health and Safety Plan
H&SC	Health and Safety Code
LDR	Land Disposal Restriction
MRLs	Minimal Risk Levels
NCP	National Contingency Plan
NWP	Nationwide Permit
OSHA	Occupational Safety and Health Administration
PAH	Polynuclear Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
PEL	Permissible Exposure Limit
PM_{10}	Particulate Matter up to 10 micrometers in size
PRG	Preliminary Remediation Goal
QAPP	Quality Assurance Project Plan
RAP	Remedial Action Plan
RAO	Remedial Action Objective
RAW	Removal Action Workplan
RCRA	Resource Conservation and Recovery Act
SCAQMD	South Coast Air Quality Management District
SLC	California State Lands Commission
TBC	to-be-considered
TRV	Toxicity Reference Value
UCL	Upper Confidence Limit
USC	United States Code
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service

bgs	below ground surface
mg/kg	milligrams per kilogram
mg/m^3	milligrams per cubic meter

EXECUTIVE SUMMARY

This Removal Action Workplan (RAW) was prepared on behalf of Hearthside Residential Corporation (Hearthside) for the approximately 42-acre Fieldstone Property (hereafter "the Site") located in an unincorporated area of Orange County, at the southern end of Graham Street, in unincorporated Orange County near Huntington Beach, California. Polychlorinated biphenyl (PCB)-contaminated soils have been detected at the northeastern portion of the Site. Based on review of existing data and evaluation of remedial action alternatives, soils containing PCB at concentrations greater than the cleanup level will be removed from the Site and disposed of offsite at a permitted facility.

The Site is adjacent to the 1200-acre Bolsa Chica Ecological Preserve. The Bolsa Chica Wetlands Steering Committee has been established for planning and environmental compliance processes to design and obtain regulatory permits for the Bolsa Chica Lowlands Restoration Project. The Steering Committee consists of eight state and federal regulatory agencies headed by the United States Fish and Wildlife Service and the California State Lands Commission (SLC). The Site has been owned by Hearthside since 1997. Negotiations are underway to transfer ownership of the Site to SLC for incorporation into the Bolsa Chica Ecological Preserve. In 1998, as part of the Bolsa Chica Lowlands investigation, SLC collected soil samples at the Site which were analyzed for PCB and other potential chemical contaminants. PCB were detected above screening levels in soil samples from the Site.

In 1999, 2001 and 2003, Hearthside's consultant conducted additional investigations to evaluate the extent of the PCB contamination and to test for other potential chemical contaminants at the Site. Hearthside's consultant collected nearly 1,000 soil samples, five groundwater samples and two surface water samples. Samples were analyzed for PCB and selected samples were analyzed for pesticides, petroleum hydrocarbons, semi-volatile organic compounds, polynuclear aromatic hydrocarbons (PAH), dioxins and furans, and metals. PCB were detected at concentrations above hazardous waste thresholds in one localized area of the site. Other chemicals analyzed were not detected at significant concentrations or are co-located with elevated PCB concentrations. Based on the available information, no contamination sources related to operations (i.e., leaking storage tanks or shipping drums) at the Site have been

identified. The soil sampling results are consistent with a historic illicit dumping of contaminants, previously cited as the likely source of PCB in Site soil.

The PCB results have shown that the mixture of PCB that exists at the Site is commonly known as Aroclor 1260. The Department of Toxic Substances Control's Human and Ecological Risk Division evaluated the concentrations of PCB in soils that would cause no adverse effects to wildlife using the Aroclor 1260 toxicity reference values (TRVs) for birds and mammals from the Bolsa Chica Ecological Risk Assessment. A 0.25 mg/kg PCB concentration, as Aroclor 1260, was calculated and established as the cleanup level for the Site soil, which is protective of both the public health and the ecological inhabitants at the Site. Using this cleanup level, an approximately 2-acre Area of Concern at the northeastern portion of the Site requires soil cleanup.

Three removal action alternatives were evaluated for the PCB soil contamination. The objective of the alternative evaluation is to produce a removal action alternative that would protect public health and the environment and that would be technically feasible. The following alternatives were evaluated based on effectiveness, implementability, and cost.

- Alternative 1: "No Action" provides a baseline for comparing other alternatives. No removal actions would be performed except for maintaining the existing fence around the 2-acre Area of Concern.

- Alternative 2: Capping with Institutional Controls would consist of leaving the PCB-contaminated soils in place and capping the 2-acre Area of Concern with an engineered cover and clean soil. Land use restrictions would be placed for the Area of Concern and the cap would be maintained and periodically inspected.

- Alternative 3: Excavation and Offsite Disposal consists of excavation, removal, and disposal of contaminated soils above the PCB cleanup level offsite.

The three alternatives were ranked according to effectiveness, implementability, and cost. Based on the results of the alternative ranking and evaluation process, the alternative to be implemented is Alternative 3: Excavation and Offsite Disposal. This alternative provides an effective cleanup in the short and long-term by permanently removing the PCB-contaminated soil from the Site in a way that can be readily implemented. The cost of this alternative would be reasonable in the long term since no additional work is required after soil removal and Site restoration.

The recommended alternative involves excavating approximately 7,000 cubic yards of PCB-contaminated soil within the 2-acre Area of Concern. Soil will be excavated from depths up to two to three feet below ground surface (ft bgs) in the Area of Concern, and depths of up to five ft bgs in a smaller area within the Area of Concern (approximately 0.2 acres). Soil excavation will be initiated after necessary permits are obtained and underground utilities are evaluated. The excavated soil will be stockpiled in a lined area at the Site and/or directly loaded to lined roll-off bins. The soil stockpile will be profiled for proper disposal to permitted disposal facilities. Confirmation soil samples will be collected from the excavation to test that soils with concentrations that are above the PCB cleanup level have been removed. Excavation and confirmation sampling will continue until soil sample results are below the cleanup level. The excavation will then be backfilled, graded and/or prepared for inclusion into the Bolsa Chica Lowlands Restoration Plan.

The Quality Assurance (QAPP) Project Plan has been prepared and will be implemented so that field and laboratory data generated during the removal action are of high quality and work is performed in accordance with current professional standards. The QAPP contains a description of procedures for collecting and handling samples, calibrating and maintaining field instruments, and managing project data and records.

Health and Safety Plan guidelines have been prepared for the implementation of the RAW. Site-specific Health and Safety Plans, which should address the guidelines, should be developed by each of the involved parties prior to fieldwork. Dust control measures during excavation, backfilling, and handling of contaminated soil will be implemented and will consist of spraying water onto the soil and work area. Dust monitoring will be conducted using direct-reading instruments and

other approved samplers to measure total dust levels in the work area and at the Site perimeter near the closest residences during field work. As required by the South Coast Air Quality Management District, a perimeter total dust action level of 0.05 milligram of dust per cubic meter of air (mg/m^3) increase between upwind and downwind locations will be used during dust-generating activities to control off-site migration of dust. Levels in excess of the action level will trigger implementation of additional dust control methods. If other dust control methods are not effective, work will be stopped until the dust levels are below the action level.

1. INTRODUCTION

This Removal Action Workplan (RAW) was prepared for the Fieldstone Property (hereafter referred to as "the Site") located in an unincorporated area of Orange County, near Huntington Beach, California (Figure 1). The Site has been owned by Hearthside Residential Corporation (Hearthside) since 1997. Although Hearthside never operated on or used the Site, Hearthside voluntarily entered into a Consent Order, Docket No. HSA-CO 01/02-154 with the Department of Toxic Substances Control (DTSC) to address the Site contamination. The Consent Order provides a framework for the investigation and cleanup of the Site. This RAW was developed on behalf of Hearthside, who is the Project Respondent under the Consent Order.

The Site is adjacent to the 1200-acre Bolsa Chica Ecological Preserve. The Bolsa Chica Wetlands Steering Committee has been established for planning and environmental compliance processes to design and obtain regulatory permits for the Bolsa Chica Lowlands Restoration Project. The Steering Committee consists of eight representatives from various state and federal agencies including the United States Fish and Wildlife Service, United States Environmental Protection Agency (USEPA), National Marine Fisheries Service, United States Army Corps of Engineers, California Department of Fish and Game, California Coastal Conservancy, California State Lands Commission (SLC), and the California Resources Agency. Negotiations are underway to transfer ownership of the Site to SLC for incorporation into the Bolsa Chica Ecological Preserve.

As part of the Bolsa Chica Lowlands investigation, soil samples were collected at the Site by the SLC in 1998 and were analyzed for polychlorinated biphenyls (PCB) and other potential chemical contaminants. PCB were detected above the screening level in a soil sample from the Site. Hearthside's consultant conducted additional investigations in 1999, 2001 and 2003 to evaluate the extent of the PCB contamination at the Site.

This RAW was prepared in accordance with the California Health and Safety Code Section 25323.1. The purpose of this RAW is to choose and describe a cleanup alternative for the Site that is protective of public health and safety and the environment. This RAW includes:

- A description of the onsite contamination
- The objectives or goals to be achieved by the removal action
- A streamlined risk evaluation to assist in focusing the removal action goals on particular chemicals and exposure pathways of concern
- Development of appropriate removal action alternatives, and analysis of these alternatives
- Comparison of alternatives, selection of a preferred alternative, and explanation of the basis for the selection

The scope of this RAW applies to the cleanup of Site soils contaminated with PCB. The remedial investigations and risk evaluation have identified PCB as the chemicals of concern at the Site. PCB and other chemicals that were investigated were not detected in surface water and groundwater.

2. SITE BACKGROUND

2.1 Site Operations

The Site has never been developed apart from minor improvements made prior to Hearthside's ownership (e.g., the man-made soil berm shown on Figure 2). It has remained unused except for limited use in agriculture and oil field operations. Available aerial photographs of the Site from 1927 to 1970 show that between 1927 and 1960 the Site was primarily undeveloped land containing seasonal ponds. Circa 1960, the oil field development extended at the southern portion of the Site with four oil wells installed and dirt roads constructed to connect adjacent oil derricks (Figure 2). These wells were abandoned according to Department of Oil and Gas and Geothermal Resources requirements prior to 1986. The oil field operations on adjacent parcels to the southwest continue to date.

In the early 1970s, the adjacent neighborhood northeast of the Site was constructed. The construction was completed in phases. Grading and construction of the residential area adjacent to the Site occurred from approximately 1972 to 1976. During this time period, grading also occurred on parts of the Site and the soil berm was constructed. The construction activity adjacent to and on the Site was not undertaken by Hearthside.

2.2 Geographic Setting

The Site encompasses approximately 42 acres and is located in an unincorporated area of Orange County, California, adjacent to the City of Huntington Beach. A Site map containing Site features is shown in Figure 2. An aerial photograph of the Site taken in 1999 is presented in Figure 3. The Site is located within the northern portion of the Seal Beach, California, United States Geological Survey 7.5-minute quadrangle map (Township 5S, Range 11W, Section 28). The Site is bordered to the south and southwest by the Bolsa Chica Lowland Ecological Preserve currently being operated as an oil production field, a residential neighborhood of Huntington Beach to the northeast, and the Wintersburg Channel and the Bolsa Chica Mesa to the northwest.

2.3 Geology and Hydrogeology

The geology in the general area of the Site is characterized by sediments consisting of alternating layers of sand, silt, clay, and occasionally gravel. These sediments were deposited throughout the area by fluvial, nearshore, and offshore depositional processes. The surface soils at the Site are characterized by intertidal and tidal flat sediments consisting of predominantly silts and clays.

The Site is located in the Santa Ana River Basin. The Santa Ana Basin Water Quality Control Plan designates the Santa Ana Pressure Basin of the Santa Ana River Basin suitable or potentially suitable for municipal or domestic supply, agricultural supply, industrial service supply, and industrial process supply. Depth to uppermost groundwater at the Site is approximately 10 feet below ground surface (ft bgs) depending on local topography. Groundwater is not withdrawn for domestic or industrial uses due to the high levels of total dissolved solids.

2.4 Surface Features

Site features are shown in Figure 2. The overall elevation of the Site is approximately mean sea level and is relatively flat. The Site topography undulates slightly (generally ±3 feet (ft)). A man-made soil berm exists along the northeastern boundary of the Site (Figure 2). This surface feature generally serves to both contain storm water run-off on the Site (except on the landward side of the berm), and to reduce run-on from adjacent properties migrating onto the Site. Currently, surface water control features such as sand bags line a segment of the northeastern edge of the Site to impede off-Site surface water migration.

During periods of high precipitation, water can accumulate in low areas of the Site forming seasonal ponds. The surface water accumulates in various areas of the Site depending on the topography. Figure 2 shows areas of the Site where seasonal ponds form when there is sufficient precipitation. The resulting seasonal ponds usually dry up toward the end of the spring season.

Scattered soil and debris piles are located throughout the Site. The primary debris pile area exists in the northeastern portion of the Site near the end of Graham Street, Bankton Drive, and Falkirk Lane. After reviewing aerial photographs of the Site

covering several decades, and interviewing parties involved in the adjacent development, no major contributor to the debris piles was identified. The debris piles may have been placed at the Site by illicit dumping of various wastes at the street ends. The majority of the debris piles and the seasonal ponds are located within a fenced area of the Site. Figure 2 shows the primary debris pile area and other Site features such as the fence, the topography, and the soil berm. The fence was first installed in 1999, subsequent to the detection of the PCB in Site soils.

Four oil wells that were abandoned prior to 1986 operated on the Site. The four former oil well locations are shown on Figure 2.

2.5 Local Climate

The climate at the Site is characterized by warm, dry summers, tempered by ocean breezes and mild winters. The average annual rainfall for the Site is approximately 12 inches per year, predominately between November and April. Depending on the amount of annual precipitation, seasonal ponds may form in the low-lying portions of the Site. Average daily temperatures range from approximately 18 degrees Celsius (°C) (64 °F) in summer to 11 degrees °C (52 °F) in winter with an annual range between 1.7 and 38 degrees °C (35 to 100 °F). The prevailing winds are on-shore from the southwest. However, in fall and early winter strong, gusty winds from the northeast deserts can occur (known as a Santa Ana condition).

3. REMEDIAL INVESTIGATION

3.1 Sources of Contamination

Site ownership, operational history, and aerial photographs were reviewed to evaluate the sources of the PCB contamination at the Site. Information that is relevant to the contaminant source investigation includes:

- The Site has largely consisted of undeveloped open space, except for limited portions of the Site that were used for short-term oil exploration and staging of equipment during the development of the adjacent residential neighborhoods;

- The Site is currently undeveloped, except for minor improvements;

- Historical aerial photographs do not provide clues or answers into the origin of Site soil contamination;

- Oil wells at the Site were abandoned prior to 1986;

- Several streets terminate at the boundary of the Site and appear to have provided access to the Site for depositing refuse materials; and

- The initial PCB detection from a Site soil sample occurred as the result of random sampling and not as part of environmental work to address specific contamination.

Based on the available information, no primary sources (i.e., leaking storage tanks or shipping drums related to Site operations) have been identified at the Site. Therefore, the possibility of secondary sources (e.g., illicit dumping of contaminated soils) was considered. The soil sampling results are consistent with a historic illicit dumping of debris, previously cited as the likely origin of PCB at the Site. The debris piles are composed primarily of concrete rubble, asphalt, wood and brick fragments. The Area of Concern, where PCB has been detected in soil samples, contains several soil and debris piles.

3.2 Site Description

The Bolsa Chica Lowlands area has been subject to environmental review based on the restoration project since 1991. In 1998, environmental investigations continued with the development of an Ecological Risk Assessment for the restoration of the Bolsa Chica Lowlands area. In 1998, the Bolsa Chica investigation included collecting soil samples at the Site. PCB was detected at 2.8 mg/kg in a soil sample taken from the Site. That PCB concentration is above the 0.22 mg/kg Preliminary Remediation Goal (PRG) for residential soil (USEPA Region 9, 2002). In 1999, 2001 and 2003, Hearthside contracted with GeoSyntec Consultants to further assess the PCB detection at the Site. Table 1 includes a chronological summary of the site investigations.

Soil, groundwater and surface water sampling was conducted at the Site to evaluate the extent of PCB contamination extent and to test for other chemical contaminants at the Site. The following sections summarize the sampling.

3.2.1 Soil

On behalf of Hearthside, GeoSyntec conducted soil sampling in 1999 and 2001 around the sampling location where the elevated PCB concentration was detected in 1998. In 2003 GeoSyntec, on behalf of Hearthside, conducted a site-wide remedial investigation and included polynuclear aromatic hydrocarbons (PAH), dioxins and furans, and metals chemical analyses, in addition to the PCB analysis. Groundwater and surface water samples were also collected and analyzed for PCB and/or PAH.

The 1999 sampling was conducted in the area where the elevated PCB concentrations were detected. Four samples were initially collected in April 1999; PCB was detected in two samples up to 7.6 mg/kg. In August and October 1999, soil samples were collected and analyzed for PCB to evaluate the nature and extent of the PCB contamination. PCB were detected in soil samples at concentrations that ranged from 0.033 mg/kg to 3,220 mg/kg. Select samples were also analyzed for petroleum hydrocarbons since PCB may exist in products as part of an oil matrix. Petroleum hydrocarbons were not detected at significant concentrations. Tables 2 and 3 include a summary of the soil sample PCB results.

In April and November 2001, soil samples were collected and analyzed for PCB and a subset of those samples were analyzed for semi-volatile organic compounds. The results indicated that PCB exists primarily in soils from 0 to 0.5 ft below ground surface (ft bgs) in an approximately two-acre area. The detectable levels of PCB are located near a densely-spaced accumulation of debris in the primary debris pile area near the street ends. Semi-volatile organic compounds were not detected. Table 2 includes a summary of the 2001 PCB soil sample results.

In September and December 2003, 733 soil samples were collected and analyzed for PCB at the surface to 6.5 ft bgs. Select samples were also analyzed for PAH, dioxins and furans, and metals. The soil sampling that occurred in 2003 was part of an extensive, site-wide Remedial Investigation (RI). The RI was performed under the oversight of the Department of Toxic Substances Control (DTSC). Figure 4 shows the soil sampling locations. PCB were detected above screening levels in samples from locations in the northeastern portion of the Site. These locations are consistent with the general area where PCB were found during historical sampling. This area is coincident with the primary debris pile area located near the northeastern property boundary where Graham Street, Bankton Drive, and Beck Circle intersect the Site (Figure 2).

Dioxin and furan analysis was performed on five of the 2003 soil samples to evaluate their potential co-location with PCB. Dioxin was detected at a concentration slightly more than the 3.9×10^{-6} mg/kg residential PRG in a sample that was co-located with elevated PCB concentrations.

Seventy (70) of the 2003 soil samples were selected for PAH analysis to evaluate the potential for co-location with PCB. PAH was detected in five samples greater than residential PRGs. The PAH results that exceed the residential PRGs are generally from samples collected in the upper 2.5 feet of the area associated with elevated PCB results.

Eighty two (82) of the 2003 soil samples were selected for metal analysis potential metal co-location with PCB and to evaluate the arsenic and lead soil concentrations where two historical soil samples were reported to contain lead or arsenic above the Bolsa Chica background concentrations. Of the 82 samples tested for metals, none were reported to contain metal concentrations above the PRGs and concentrations were consistent with background levels as established in the Bolsa Chica Ecological Risk Assessment (CH2MHill, 2002). In the vicinity of the two historical

sample locations with elevated arsenic or lead results, none of the twelve arsenic results were above background and one of the twelve lead results was above the background concentration, but the lead concentration was only approximately ten percent of its residential PRG.

3.2.2 Ground Water

In October 2003, groundwater samples were collected from five locations and analyzed for PCB and PAH. The groundwater samples did not contain detectable concentrations of PCB or PAH. The analytical results suggest that PCB and PAH are confined to Site soil and have not migrated to groundwater underlying the Site.

3.2.3 Surface Water

Five surface water samples were planned for the 2003 investigation. However, because of insufficient storm water accumulation after heavy rains, two surface water samples were collected. Those two samples were collected in April 2004 and analyzed for PCB. The surface water samples did not contain detectable concentrations of PCB.

3.3 Nature and Extent of Contamination

Approximately 200 Site soil samples were collected and analyzed from 1998 to 2001. During the 2003 investigation, the data set was expanded by collecting another 733 soil samples, five groundwater samples and two surface water samples, and analyzing for PCB, dioxins and furans, PAH, and metals. The results of this sampling and the 1999 and 2001 sampling events were compiled and evaluated. The compiled data indicates that the soil is contaminated with PCB, and groundwater and surface water have not been affected by the soil contamination. The extent of PCB impacted soil above the cleanup level (see Section 4) was estimated to be approximately 2 acres in area (Figure 5).

Dioxins, furans and PAH were detected at low concentrations in a limited number of soil samples with elevated PCB concentrations, and therefore will be

addressed by this Removal Action. Metals were detected at concentrations that do not need to be addressed, based on background concentrations reported in the Bolsa Chica Ecological Risk Assessment.

4. RISK EVALUATION

4.1 Introduction

PCB analyses at the Site have shown that the mixture of PCB congeners is best described as Aroclor 1260. Based on this, DTSC's Human and Ecological Risk Division determined the concentrations of PCB in soils that would not pose a significant risk to human health or wildlife. The resulting PCB concentrations were used to establish a PCB cleanup level for the Site that is protective of both human health and wildlife. Other contaminants at the Site were not detected, were detected below PRGs or background concentrations, or were found in the area of the Site with the highest PCB concentrations.

4.2 Human Health Risks

Various cleanup and screening levels for PCB that are protective of human health were considered in establishing a cleanup level for the Site. These cleanup and screening levels include the PRGs established by the USEPA, Region 9, the minimal risk levels (MRLs) used by the Agency for Toxic Substances and Disease Registry (ATSDR) and the PCB cleanup level for high occupancy areas established by USEPA pursuant to the Toxic Substances Control Act. The PRG for residential soil is 0.22 mg/kg which is based on carcinogenic PCB (e.g., Aroclor 1260) and an excess cancer risk of 10^{-6}. PRGs for residential soil are developed assuming long-term or lifetime exposures to contaminants through ingestion, skin contact and inhalation and are not applicable in determining whether short-term exposures pose a risk to human health. The PRG applies to average exposure concentrations at the 95th percentile Upper Confidence Limit (UCL) of the mean and are not intended to be used as a field performance objective or ceiling value, meaning that concentrations above the PRG would not necessarily need to be removed in order to be health protective as long as the 95th percentile UCL is below the PRG. The noncarcinogenic PRG for Aroclor 1260 is 3.9 mg/kg and the MRLs range from 1.5 to 25 mg/kg. Pursuant to the Toxic Substances Control Act, the PCB cleanup level for high occupancy areas is 1.0 mg/kg. Therefore, a field performance objective of 1.0 mg/kg with a 95th percentile UCL of less than 0.22 mg/kg was established for the cleanup of PCB-contaminated soil conducted by DTSC in the residential area adjacent to the Site. This cleanup approach would also be applicable if the Site were developed for residential use.

4.3 Ecological Risks

The concentrations of PCB in soils that would cause adverse effects to wildlife were evaluated using the Aroclor 1260 toxicity reference values (TRVs) for birds and mammals from the Bolsa Chica Ecological Risk Assessment. Consistent with this approach, risks were estimated for populations of common or representative species and listed species that inhabit the Site (DTSC, 2004). Appendix A includes DTSC's ecological risk evaluation.

The ecological receptor potentially most at risk from PCB at the Site is the Belding's savannah sparrow because: 1) this sparrow has a larger area use factor than other species and may receive 100 percent of its diet from the Site, and 2) it is a listed species and should be protected at the individual level rather than population level. In order to provide protection for the Belding's savannah sparrow, the concentration of PCB at the Site must be no greater than 0.25 mg/kg PCB as Aroclor 1260 in the soil.

DTSC's evaluation also concluded that none of the "safe" concentrations for other contaminants (i.e., arsenic, lead, etc.) were exceeded at the Site.

5. REMOVAL ACTION OBJECTIVES

5.1 Removal Action Objectives

Removal Action Objectives (RAOs) are goals developed for the protection of human health and the environment, and are based on chemical concentrations and potential exposure routes. Protection of human health and the environment can be achieved by reducing chemical concentration levels and/or eliminating potential exposure pathways.

The primary RAOs for the Site are to:

- Reduce risks to ecological receptors to a level consistent with habitat quality in non-contaminated areas of the Bolsa Chica Lowlands.
- Reduce human exposure to PCB-contaminated soil.
- Mitigate potential impacts to groundwater and surface water via PCB soil contamination.

The soil cleanup level (0.25 mg/kg of PCB in soil) was developed using the Bolsa Chica Lowlands Ecological Risk Assessment and Site data. The methodology used to develop the soil cleanup level is explained in Section 4.0-Risk Evaluation.

Other objectives of the removal action are to:

- Increase, to the extent practicable, the amount of land available for incorporation into the Bolsa Chica Restoration Plan.
- Perform minor recontouring to make the excavated area compatible with the existing surrounding environment and proposed land use.
- Expedite Site cleanup and restoration.

5.2 Statutory Limits on Removal Actions

Section 25323.1 of the California Health and Safety Code, relating to hazardous substances, states that a site is exempted from the requirement for a Remedial Action Plan (RAP) if DTSC takes a non-emergency removal action at a site and the estimated cost of the removal action is less than $1,000,000. The RAP process involves a more extensive remedial evaluation due to the complexity and magnitude of a site cleanup. The removal action alternatives discussed in Section 6.0-Removal Action Alternatives are estimated to cost less than $1,000,000. Therefore, in lieu of a RAP, this RAW has been prepared.

5.3 Applicable or Relevant and Appropriate Requirements

Applicable or Relevant and Appropriate Requirements (ARARs) are categorized as chemical-, action-, or location-specific. Chemical-specific requirements are typically health or risk-based criteria that establish the acceptable amount or concentration of a chemical that may be found in or discharged to the ambient environment. Action-specific requirements generally set performance, design, or other similar action-specific controls related to the management of hazardous substances. Location-specific requirements address restrictions on the performance of activities or the concentrations of hazardous substances solely because they occur in a particular location.

In addition to ARARs, which are regulatory requirements, to-be-considered (TBC) guidelines should also be identified. TBC are non-binding criteria, advisories, guidance, and proposed standards that might provide useful information or recommended procedures for developing objectives that protect human health and the environment.

ARARs were developed for the Site removal action using federal, state and local statutes, regulations, and guidance. ARARs are listed in Table 4.

5.4 Site Cleanup Level

A Site-specific cleanup level was developed to achieve a level of remediation that will be protective of human health and wildlife. The primary chemical of concern in the soil is PCB. As discussed in Section 4.0, the risk evaluation shows that leaving the existing PCB contamination in the soil would result in a risk to public health and wildlife. Based on the risk evaluation, the PCB soil cleanup level for the Site will be 0.25 mg/kg for protection of wildlife since the Site will be incorporated in the Bolsa Chica Ecological Preserve. Essentially, the cleanup level of 0.25 mg/kg is the highest concentration of PCB that could be left in the Site soil without posing a significant risk to human health or wildlife. This cleanup level is also protective of human health, based on the risk evaluation.

6. DEVELOPMENT AND EVALUATION OF REMOVAL ACTION ALTERNATIVES

Removal action alternatives are developed and evaluated in accordance with the Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA (USEPA, 1989) and the Guidance for Conducting Non-Time Critical Removal Actions Under CERCLA (USEPA, 1993). The following three removal action alternatives were evaluated and are described below: 1) No Action; 2) Capping with Institutional Controls; and 3) Excavation and Off-Site Disposal.

6.1 Alternative 1: No Action

Evaluation of the No Action alternative is consistent with the National Oil and Hazardous Substances Pollution Contingency Plan (NCP) under Title 40 of the Code of Federal Regulations, Part 300. The No Action Alternative provides a baseline for comparing other alternatives. This alternative consists of leaving the contaminated soils in place without treatment and institutional controls (i.e., fence and land use restrictions). This alternative provides no control of exposure to the contaminated soil and no reduction in risk to human health and the environment. It also allows for the possible migration of the contaminants to surface water and groundwater.

6.2 Alternative 2: Capping with Institutional Controls

Capping with Institutional Controls involves covering the contaminated soils with an engineered cover consisting of geosynthetic layers, asphalt, concrete, or soil and vegetation, and placing institutional controls on the Area of Concern at a site. Institutional controls would include placing land use restrictions and securing the Area of Concern with a fence. Land use restrictions would prohibit use of the Site for residential purposes or other sensitive land uses, and require development of a soil management plan and health and safety plan for construction workers. This alternative would also require cap maintenance and periodic cap inspections.

6.3 Alternative 3: Excavation and Off-Site Disposal

Excavation and Off-site Disposal involves the removal of contaminated soil by excavating the contaminated areas and transporting the soil by a licensed hauler to an approved landfill or other disposal facilities. Contaminated soils would be removed until sampling of the excavated area showed residual PCB concentrations in compliance with the cleanup level. The need to dispose of the waste in a Class I or other appropriate landfill would depend on its waste classification. In addition, the contaminated soil would also have to be profiled to determine the applicability of Land Disposal Restrictions (LDR) requirements.

Confirmatory sampling would be performed after excavation to test the remaining soil for compliance with the cleanup level. If needed, soil excavation and confirmatory sampling would be continued until the remaining concentrations are less than or equal to the cleanup level. Once the cleanup level has been met, minor Site re-contouring would occur in the excavated area. The area would eventually be handled as prescribed in the Bolsa Chica Lowlands Restoration Plan.

7. ANALYSIS OF REMOVAL ACTION ALTERNATIVES

7.1 Evaluation Criteria

The USEPA's Guidance for Conducting Non-Time Critical Removal Actions Under CERCLA suggests that the alternatives be evaluated against the short- and long-term aspects of the three evaluation criteria; effectiveness, implementability and cost.

7.1.1 Effectiveness

The short-term effectiveness of each alternative during construction, implementation, and operation are assessed. Factors considered include protection of the community and workers during removal operations, the time required to implement the alternative and to achieve the removal action goals, and the potential adverse environmental impacts that may result. The ability of each alternative over time to maintain reliable protection of human health and the environment, once the removal action objectives have been met is also considered.

7.1.2 Implementability

Implementability of an alternative is based upon the technical and institutional feasibility of implementing that particular alternative. Technical feasibility includes the availability of treatment, storage, and disposal services, and the availability of necessary equipment and skilled workers to implement the particular process. Institutional feasibility includes obtaining the necessary permits or regulatory concurrence.

7.1.3 Cost

Costs used during the analysis are the estimated amount to implement each alternative. The focus should be to make comparative estimates for alternatives with relative. Costs include capital cost, labor and operation and maintenance.

7.2 Detailed Evaluation of Removal Action Alternatives

The following is an evaluation of the individual removal action alternatives against the three evaluation criteria: effectiveness, implementability, and cost.

7.2.1 Alternative 1: No Action

The No Action alternative consists of leaving the PCB-contaminated soils in place without treatment. The Area of Concern would be kept fenced and secured.

7.2.1.1 Effectiveness

The No Action alternative would not effectively mitigate the risk to human health and the environment under current or future uses. This alternative does not include actions that would reduce the toxicity, mobility, or volume of the PCB-contaminated soils through treatment. The No Action alternative is not protective of human health and the environment and would not achieve the Site RAOs.

7.2.1.2 Implementability

This alternative would be physically implementable as it does not require any action. However, it would not be implementable from an administrative perspective, because regulatory requirements require mitigation of potential Site risks.

7.2.1.3 Cost

Except for maintaining the existing fence around the Area of Concern, there are no costs associated with this alternative.

7.2.2 Alternative 2: Capping with Institutional Controls

Capping with institutional controls involves covering the PCB-contaminated soils in the 2-acre Area of Concern at the Site with an engineered cover consisting of geosynthetic layers, asphalt, concrete, or soil and vegetation. Institutional controls, such as land use restrictions would be placed on the capped area to restrict land development and put requirements in place to reduce exposure if the area is disturbed.

7.2.2.1 Effectiveness

Alternative 2 is anticipated to be effective in mitigating human and wildlife exposures to PCB by providing a barrier to direct contact with soil. Therefore, this alternative would be effective over the short-term; however, its long-term effectiveness would be dependent on proper cap maintenance. Capping would require relatively minor disturbance of the PCB-contaminated soils during implementation and there would be a lower potential for worker exposure than with alternatives that involve disturbing larger volumes of soil.

7.2.2.2 Implementability

Common construction techniques and materials would be used to cap the Area of Concern and would be locally available. The land use restrictions would require the property owner to enter into an agreement with DTSC and record the restrictions. Land use restrictions on the Area of Concern could limit future Site development.

7.2.2.3 Cost

The estimated capital and post-removal maintenance costs of Alternative 2 are approximately $330,000 to construct and $8,000 per year to maintain. The cost breakdown is presented in Table 5.

7.2.3 Alternative 3: Excavation and Offsite Disposal

Alternative 3 would include excavation of PCB-contaminated soils to a depth of about one to five feet bgs across the Area of Concern. The total volume of soil to be excavated and disposed of is estimated to be 7,000 cubic yards. The excavated soil would be transported and disposed at appropriate disposal facilities, depending on the waste classification and LDR.

7.2.3.1 Effectiveness

Excavation and offsite disposal is anticipated to be effective in reducing human exposures to PCB by removing from the Site soil that poses a significant risk to human health and the environment (i.e., PCB in excess of 0.25 mg/kg). The excavation operations would have the potential for dust emissions and worker exposure. However, these short-term impacts would be controlled by appropriate measures for dust suppression, air monitoring, and use of personal protective equipment. No ongoing long-term maintenance would be required after removing PCB-contaminated soil from the Site. There would be no limitations on future Site development plans with this alternative.

7.2.3.2 Implementability

Excavation and offsite disposal is a well-established cleanup method. The materials, labor, and services that would be required to excavate the PCB-contaminated soil and suppress dust would be locally available. No major underground utilities should be encountered. However, an underground utilities survey will be performed

prior to excavation to mark potential utility locations. Excavation may proceed slower in areas that have the potential to contain underground utilities.

7.2.3.3 Cost

The estimated capital cost for Alternative 3 is $590,000. There would be no post-removal costs for Alternative 3. The cost breakdown is presented in Table 6.

8. COMPARATIVE ANALYSIS OF ALTERNATIVES

The following comparative analysis of the three alternatives is an evaluation of the relative performance of each alternative in relation to the three criteria. The purpose of the comparative analysis is to evaluate the advantages and disadvantages of each alternative relative to one another so that key tradeoffs which should be considered in selecting the removal action alternative for the Site can be reviewed.

8.1 Effectiveness

Alternative 1 (No Action) requires no construction other than maintaining a fence around the Area of Concern to minimize exposure to contaminated soils. The level of long-term protection of public health and the environment provided by this alternative would be dependent on how effective the fence would be in preventing entry to the Area of Concern by people and wildlife.

Alternative 2 (Capping with Institutional Controls) involves capping of contaminated soil in place. Capping would effectively introduce a barrier to people and wildlife from coming in contact with the contamination, provided that the cap is properly maintained over the long-term. Construction of a cap would involve limited disturbance of contaminated soil, would be done using common construction techniques and materials, and can be done in a short time period. However, if the Site is developed in the future, the contaminated soils would have to be managed appropriately to avoid possible human exposure. There would also be limitations on the future development.

Alternative 3 (Excavation and Offsite Disposal) involves removal of contaminated soil from the Site for off-site disposal at permitted facilities. Although this alternative involves the greatest disturbance of contaminated soil during implementation, dust mitigation measures are expected to control worker dust exposure and fugitive dust. The work will be conducted within the Site boundaries, the excavation area is not extensive and the time to complete the removal is relatively short. A Health and Safety Plan (HSP) would be prepared and would identify the measures, including air monitoring that would be taken to protect the workers and the public during construction.

8.2 Implementability

Alternative 1 (No Action) is technically feasible since it does not require any remediation other than maintaining the fence. It is the simplest to implement of the three alternatives.

Alternative 2 (Capping with Institutional Controls) is technically and administratively implementable. Expertise, contractors, equipment and materials are readily available to implement this alternative. The property owner would have to enter into and record a Land Use Covenant for the capped area. Hearthside has indicated their willingness to do this, if necessary.

Alternative 3 (Excavation and Offsite Disposal) is technically and administratively implementable. Engineering controls will be implemented to control contaminant exposure during excavation activities.

8.3 Cost

Alternative 1 (No Action) has no associated cost except for fence maintenance.

Alternative 2 (Capping with Institutional Controls) has an initial cost that is less than Alternative 3. There would be long-term costs for ongoing cap and fence maintenance activities.

Alternative 3 (Excavation and Offsite Disposal) has a higher cost than the other alternatives, but long-term maintenance would not be required and there would be no long-term costs.

The cost summary for the alternatives is provided in Tables 5 and 6. Alternative 1 (No Action) involves minor costs, Alternative 2 (Capping with Institutional Controls) is estimated to cost approximately $330,000 to construct and $8,000 per year to maintain thereafter, and Alternative 3 (Excavation and Offsite Disposal) is estimated to cost approximately $590,000 with no subsequent maintenance costs.

9. RECOMMENDED REMOVAL ACTION ALTERNATIVE

Considering the objectives for this Site, the recommended removal action is Alternative 3 - Excavation and Offsite Disposal. This alternative is recommended because it is expected to most effectively achieve the primary RAOs of mitigating the risk to ecological receptors, preventing human contact with the PCB-contaminated soil, and preventing impacts to surface water and groundwater. This alternative would also most effectively achieve the other RAOs identified in Section 5.1 which are related to future Site use and restoration and there would be no limitations on the future use of the Site. Potential short-term community or worker exposures are anticipated to be minor and can be addressed with engineering controls. The alternative is expected to be readily implementable both technically and administratively. The estimated cost for this alternative is $590,000. Although the cost is higher than the other alternatives, it does not require long-term maintenance and there would be no long-term operational costs.

10. IMPLEMENTATION OF RECOMMENDED REMOVAL ACTION ALTERNATIVE

10.1 Introduction

The selected alternative entails excavation and offsite disposal of PCB-contaminated soil followed by minor site recontouring. DTSC has determined that removal of soil containing PCB above the cleanup level of 0.25 mg/kg will protect human and environmental health. This section describes activities and procedures for the recommended alternative.

10.2 Permitting

Excavation to remove the PCB contamination above the cleanup level will extend into areas of soil where seasonal ponds sometimes form. These seasonal ponds are usually dry in the summer months. Cleanup of the seasonal ponds falls within the Nationwide Permit (NWP 38) under Section 404 of Clean the Water Act for cleanup of hazardous and toxic waste. However, activities undertaken entirely on a Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) site by authority of CERCLA as approved or required by USEPA, are not required to obtain permits. The restoration of the seasonal ponds will be included in the Bolsa Chica Restoration Plan. An excavation/grading permit may also be required by the Orange County. Necessary permits will be obtained before the start of field work.

10.3 Utilities Clearance

Underground Service Alert will be notified for a utility check. Affected utility companies will be consulted to evaluate conflicts with the proposed excavation activities. If necessary, an underground utility locating service will be called to the Site to more accurately mark location and depth of the utilities of concern.

10.4 Health and Safety Plan

Site-specific health and safety guidelines are included in Appendix B. Appendix B provides relevant health and safety guidelines for implementation of the RAW. Each party that will be conducting fieldwork during the removal action should review Appendix B and prepare their own site-specific Health and Safety Plan (HSP) that, at a minimum, addresses the following:

- health risks and hazards posed by the Site cleanup activities,
- employee training for compliance with Title 8 of the California Code of Regulations,
- personal protective equipment,
- frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used,
- site control measures,
- decontamination procedures,
- an emergency response plan,
- a spill containment program, and
- procedures for providing potable water and a sanitary facility to site personnel.

10.5 Air Monitoring

The objectives of the air monitoring program are to collect data that will be used to guide health and safety procedures during the removal action (worker air monitoring) and to document conditions during the construction activities (perimeter monitoring). The air monitoring program will utilize direct-reading instruments to provide real-time data.

PCB concentrations in surficial soil were estimated to evaluate the potential concentrations of PCB that could be in fugitive dust. The chemical of concern at the Site is PCB, which was detected in earlier investigations up to 3,220 mg/kg at a depth of 0.5 to 1 foot bgs. However, resampling of this area in 2003 resulted in a highest PCB detection of 590 mg/kg. The average detected PCB concentration from the surface soil samples (0 to 0.5 ft bgs) collected in the 2-acre Area of Concern is approximately 25 mg/kg, which is an estimate of the average PCB concentration in fugitive dust from surficial soil.

10.5.1 Methodology

Because PCB adheres to dust, monitoring and mitigation of dust particulates in air will provide adequate protection for workers and the public. Worker dust monitoring will be conducted using a hand-held dust meter in the soil excavation area. Perimeter monitoring will use a data-logging real time monitor between the excavation and the residential area.

Worker air monitoring for dust will be conducted periodically during those times when activities may generate dust from contaminated soil. These activities include excavation, stockpiling, and loading of the stockpiled soil into bins. Dust meter readings will be recorded in field notes hourly during designated activities. The reading frequency may be adjusted depending on initial readings the PCB soil concentrations.

Perimeter air monitoring will be conducted during excavation and stockpiling activities. Monitoring stations will be set up between the excavation area and the residences before the start of excavation. The exact location will be selected by

the Site safety officer and will be based on the location of activities and the wind direction.

10.5.2 Equipment Calibration

The air monitoring equipment will be calibrated daily before the start of field work in accordance with the manufacturer's instructions. Calibrations will also be performed at the completion of each day's air monitoring activities. Calibration readings and results will be recorded twice daily.

10.5.3 Training Requirements

Personnel conducting air monitoring will have the training and experience to properly perform the air monitoring and equipment calibration.

10.5.4 Action Levels

Dust action levels also apply to this Removal Action since PCB could be adsorbed onto soil and transported from the Site or inhaled by workers who breathe in dust particles. Dust is measured in terms of milligram per cubic meter (mg/m^3), which is a measure of the mass of dust per a given volume of air and differs from PCB concentrations in soil, which are a measure of the mass of PCB per a given mass of soil. The soil PCB concentrations can be used to estimate the dust action levels.

Chemical-specific action levels for dust, based on worker protection, are called Permissible Exposure Limits (PELs) established by the Occupational Safety and Health Administration (OSHA). The OSHA PEL for PCB is 1.0 mg/m^3. For the worker protection, the action level for PCB in dust can be calculated from the OSHA PEL and the maximum concentration of PCB found in the soil to be excavated according to the following equation:

$$\text{Worker Dust Action Level} = \frac{\text{PEL for PCB } (mg/m^3)}{\text{Maximum Soil Concentration } (mg/kg)} \times 10^6$$

$$\text{Worker Dust Action Level} = \frac{1.0\ \text{mg/m}^3}{3{,}220\ \text{mg/kg}} \times 10^6 = 310\ \text{mg/m}^3$$

This calculated action level is much greater than the OSHA PEL for nuisance dust or particulate matter (PM) of 5.0 mg/m^3 for protection of workers. For protection of the general public, the South Coast Air Quality Management District (SCAQMD) has established a PM_{10} action level for activities or man-made conditions capable of generating fugitive dust. PM_{10} includes particles with an aerodynamic diameter of less than 10 microns. SCAQMD's Rule 403 states that no person shall cause or allow PM_{10} levels to exceed 0.05 mg/m^3 when determined, by simultaneous sampling, as the difference between upwind and downwind samples collected on high volume particulate matter samples or other USEPA-approved method for PM_{10} monitoring. If sampling is conducted, samplers shall be: 1) operated, maintained, and calibrated in accordance with USEPA-approve methods; and 2) reasonably placed upwind and downwind of key activity areas and as close to the property line as feasible, such that sources of fugitive dust between the sampler and the property line are minimized.

Therefore, the following dust action levels are proposed.

	Dust Action Level	**Basis**
Work Zone	5 mg/m^3	OSHA – Worker protection
Perimeter	0.05 mg/m^3	SCAQMD – Difference between upwind and downwind location

The site safety officer will perform hand-held air monitoring in the excavation area and will monitor the data loggers at the perimeter at least twice a day during the designated activities. The data will be downloaded into a computer at the end of each day and the results included in the removal action completion report.

The applicable "Best Available Dust Control Measures" for dust that are included in Table 1 of Rule 403 will be implemented during excavation, backfilling, and handling of contaminated soils to control fugitive dust emissions. Removal activities will be suspended when winds (instantaneous gusts) exceed 25 miles per hour (mph) or sustained readings of 15 mph for one minute are observed.

10.6 Excavation and Confirmation Sampling

The area requiring excavation is located within an approximately two-acre area and the expected deepest excavation is approximately five ft bgs. Figure 5 shows the areal and vertical view of the excavation using the 0.25 mg/kg PCB cleanup level. Post-excavation soil sampling will be performed within the limits of the excavation. This soil sampling will be performed to evaluate whether residual PCB exceeding the cleanup level remain in the underlying soil. Additional excavation will be conducted as warranted by the post-excavation soil sampling results.

The excavated area will be divided in a grid of areas approximately 50-ft by 50-ft. The grid areas will be visually subdivided into four smaller 25-ft by 25-ft subgrids. A sample will be collected from the approximate center of each subgrid. The four subgrid samples collected per 50-ft by 50-ft area will be composited in equal volume portions and homogenized. The compositing and homogenization procedures will be performed by the analytical laboratory. Discrete samples will also be collected from the approximately 0.2-acre area where the highest PCB concentrations have been found. The resulting grid area composite samples and discrete samples will be analyzed for PCB using USEPA Method 8082. The remaining portions of the subgrid samples will be archived pending analytical results of the composited sample. Subgrid sample locations will be marked at the time of sampling and coordinates will be documented relative to the existing site survey. One subgrid duplicate sample will be collected per 20 subgrid samples and analyzed for PCB. Additionally, the analytical laboratory will be instructed to duplicate the compositing, homogenization, and analysis procedures for two to three grid area composite samples.

If the laboratory result from the composite sample shows a PCB concentration equal to or less than 0.25 mg/kg, the 50-ft by 50-ft grid will be considered clean. Once these conditions are met in an applicable area, no further sampling or excavation will be conducted in that area. If the laboratory result shows a PCB concentration greater than 0.25 mg/kg, an additional layer of soil (3 inches or greater) will be removed from the floor of the 50-ft by 50-ft grid and the post-excavation verification sampling procedure described previously will be repeated.

The confirmation Sampling Plan is included as Appendix C. The Sampling Plan includes information on:

- sampling objectives;
- sample locations;
- sample designation or numbering system;
- detailed specification of sampling equipment and procedures; and
- sample handling and analysis including preservation methods, shipping requirements and holding times.

10.7 Stockpiling, Loading, and Waste Profiling

Approximately 7,000 cubic yards of contaminated soil will be excavated and removed from the Site as part of the planned removal action. The excavated soil will be stockpiled in a lined area onsite or loaded directly into lined rolled-off bins prior to hauling off-site. The stockpile and bins will be kept covered while onsite to control fugitive dust. The soil stockpile will be loaded into bins and trucks with a backhoe or front end loader. Loading will be performed to reduce the potential for spill or dust by placing soil from the backhoe and front loader into the bins and trucks from the lowest feasible height. Water will be sprayed on the soil, if necessary to suppress potential dust while loading. No loading will be performed during unfavorable weather conditions or when winds (instantaneous gust) exceed twenty-five miles per hour (mph), or sustained readings of 15 mph for one minute are observed.

Soil with PCB concentrations that are greater than or equal to 50 mg/kg will be disposed of in a Class I disposal facility. For disposal at a Class I or Class II disposal facility, waste profiling will be required before acceptance by the facility. A separate stockpile for soils with potential PCB concentrations at or in excess of 50 mg/kg may be used to segregate soil for subsequent disposal at different facilities. The soil to be disposed will be profiled based on requirements by the disposal facilities.

10.8 Transportation Plan

The objective of the waste transportation and disposal program is to handle, transport, and dispose of PCB-contaminated materials exceeding the cleanup level according to applicable regulations and in an environmentally sound and safe manner. Soil will be loaded into hauler trucks, each capable of hauling approximately 15 to 20 tons of soil. Truck boxes will be covered with a secured tarp before they leave the

Site. The hauler trucks will be provided and operated by a licensed trucking company. It is estimated that about 300 truckloads will be needed to remove 7,000 cubic yards of PCB-contaminated soil from the Site. Truck traffic will be limited to 30 trips per day, between the hours of 7:00 a.m. and 6:00 p.m. Monday through Friday. A manifest will be prepared for each truckload and a generator's copy will be retained by the field engineer for logging and tracking purposes.

Soil with 50 mg/kg or more of PCB will be transported to a Class I landfill. The closest Class I landfill to the Site is Chemical Waste Management Kettleman Hills Landfill located in Kettleman City, California. This landfill is a permitted Class I (hazardous waste), Class II (lower concentration waste) and Class III (municipal waste) disposal and treatment facility. Another potential disposal facility alternative is the U.S. Ecology, Inc., facility located in Beatty, Nevada. The U.S. Ecology Beatty Facility accepts PCB wastes. Soils with lower PCB concentrations (less than 50 mg/kg) may be transported to other Class II landfills or other disposal facilities. The proposed transportation route occurs primarily on Interstate and State highways and was chosen to reduce travel over city streets and through residential areas to the extent practicable. Trucks will follow the existing unimproved access roads that extend seaward and south from the excavation area towards Seapoint Avenue. These roads go through the uninhabited Bolsa Chica. The route described below would be followed from Seapoint Avenue.

Class I landfill: From Seapoint Avenue, trucks will travel the following route to the Class I disposal facility at 35251 Old Skyline Road, Kettleman City, California.

Turn right from the Seapoint Avenue gate onto Seapoint Avenue
Turn left onto Pacific Coast Highway South
Turn left onto Beach Boulevard North
Merge onto I-405 North toward Long Beach
Merge onto I-5 North
Merge onto CA-41 North toward Kettleman City

Class II landfill: From Seapoint Avenue, trucks will travel the following route to McKittrick Waste Class II disposal facility at 56533 Highway 58 West, McKittrick, California.

Turn right from the Seapoint Avenue gate onto Seapoint Avenue
Turn left onto Pacific Coast Highway South
Turn left onto Beach Boulevard North
Merge onto I-405 North toward Long Beach
Merge onto I-5 North
Take exit number 257 toward CA-58/Buttonwillow/McKittrick

10.9 Quality Assurance Project Plan

The Quality Assurance Project Plan (QAPP) is included as Appendix D. The QAPP includes information on:

- project organization and responsibilities with respect to sampling and analysis;
- quality assurance objectives for measurement including accuracy, precision, and method detection limits;
- sampling procedures;
- sample custody procedures and documentation;
- field and laboratory calibration procedures;
- analytical procedures;
- laboratory to be used certified pursuant to H&SC section 25198;
- specific routine procedures used to assess data (precision, accuracy and completeness) and response actions;
- reporting procedure for measurement of system performance and data quality;
- data management, data reduction, validation and reporting; and

- internal quality control.

10.10 Removal Action Completion Report

A Removal Action Completion Report will be prepared and submitted to DTSC approximately four to six months after the conclusion of excavation and confirmation sampling and equipment, contaminated soil stockpiles, and construction debris are removed from the Site. The report will document removal action activities and include confirmation sampling results. The excavated areas will not be restored as part of the removal action since they are to be included in the restoration of the adjacent Bolsa Chica Lowlands as described in the Bolsa Chica Lowlands Restoration Plan.

11. SCHEDULE

The Draft RAW will undergo a 30-day public comment period. Comments on the Draft RAW will be incorporated in the Final RAW and/or addressed in a Responsiveness Summary that will be part of the Final RAW. A schedule for the project following DTSC approval of the Draft RAW follows:

Comment period on the Draft RAW – one month
Final RAW/Responsiveness Summary – two weeks
RAW implementation – two to three months
Removal Action Completion Report – four to six months

This schedule is tentative and may be modified based on actual progress.

12. PUBLIC PARTICIPATION

A Public Participation Plan (PPP) was prepared in 2003 for the Site. The PPP provides a process for and identified activities to: inform the affected community, individuals, and organizations; assess the public and community interests; and involve the public in the decision-making process. Pursuant to the PPP, a Fact Sheet has been prepared that summarizes the contents of the Draft RAW and presents the recommended removal action. The Fact Sheet was distributed to the surrounding residents, interested individuals, elected officials, and interested and affected organizations and companies. The Fact Sheet also announces the 30-day comment period and the public meeting to present the Draft RAW and solicit comments. At the close of the public comment period, DTSC will carefully consider public comments before finalizing the RAW. A Responsiveness Summary will be prepared and placed in the information repositories. A copy of the Responsiveness Summary will be mailed to individual organizations who submit comments to DTSC.

13. CALIFORNIA ENVIRONMENTAL QUALITY ACT

In accordance with the California Environmental Quality Act (CEQA), DTSC has evaluated the proposed removal action to determine associated potential adverse environmental impacts and found that there are no negative impacts. DTSC has determined that the proposed removal action is exempt from the California Environmental Quality Act (CEQA) and would have no impact on the environment due to the small volume of soil, the limited area, and the short duration of the project. Therefore, DTSC has prepared a Notice of Exemption in compliance with CEQA for the project.

14. ADMINISTRATIVE RECORD LIST

Site Specific Records (Available at the DTSC file room under Fieldstone Property)

Consent Order (CO) between Hearthside Residential Corporation and the Department of Toxic Substances Control, Consent Order Docket No. HSS-CO 01/02-154, 01 July 2002.

Department of Toxic Substances Control, Darrel Lauren, Staff Toxicologist, Safe Soil PCB Concentrations for the Fieldstone Property, 22 June 2004.

GeoSyntec Consultants, Remedial Investigation Workplan, Fieldstone Property, Consent Order Docket No. HSA-CO 01/02-154, 21 July 2003.

GeoSyntec Consultants, Workplan for Additional Soil Sampling, Fieldstone Property, Orange County, California, 22 December 2003.

GeoSyntec Consultants, Remedial Investigation Report, Fieldstone Property, Consent Order Docket No. HSA-CO 01/02-154, 18 June 18 2004.

Harris and Company, Public Participation Plan, Fieldstone Property, 10 February 2003.

Regulatory Records (Readily Available)

South Coast Air Quality Management District, Rule 403: Fugitive Dust, 2 April 2004

State of California, California Code of Regulations, Title 22 Divisions 4 and 4.5, Volume 29 A.

State of California, California Health and Safety Code, Division 20, Chapters 6.5, 6.6 and 6.8.

State of California, Governor's Office of Planning and Research, California Environmental Quality Act, Statutes and Guidelines, June 1994.

United States Army Corps of Engineers, Issuance of Nationwide Permits; Final Notice, 15 January 2002.

United States Environmental Protection Agency, The Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA), September 1986.

United States Environmental Protection Agency, Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, October 1988.

United States Environmental Protection Agency, Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA, EPA/540-R-93-057, August 1993.

United States Environmental Protection Agency, 2002. Region 9 – Preliminary Remediation Goals (PRGs), October 2002.

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CH2MHill, Ecological Risk Assessment for Bolsa Chica Lowlands Project, Huntington Beach, California, Prepared for United States Fish and Wildlife Service, July 2002.

Chambers Group, Inc., Final Environmental Impact Report/Environmental Impact Statement for the Bolsa Chica Lowlands Restoration Project, Prepared for California State Lands Commission, April 2001

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Department of Toxic Substances Control, Transportation Plan, Preparation Guidance for Site Remediation, May 1994.

Department of Toxic Substances Control, Document #: E0-94-012-MM, Exemptions and Preparation of Notices of Exemption Pursuant to Requirements of the California Environmental Quality Act, 17 January 1995.

Department of Toxic Substances Control, Darrel Lauren, Staff Toxicologist, Safe Soil PCB Concentrations for the Fieldstone Property, 22 June 2004.

GeoSyntec Consultants, Remedial Investigation Workplan, Fieldstone Property, Consent Order Docket No. HSA-CO 01/02-154, 21 July 2003.

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South Coast Air Quality Management District, Rule 403: Fugitive Dust, 2 April 2004

United States Army Corps of Engineers, Issuance of Nationwide Permits; Final Notice, 15 January 2002.

United States Environmental Protection Agency, Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA, October 1988.

United States Environmental Protection Agency, Guidance on Conducting Non-Time-Critical Removal Actions Under CERCLA, EPA/540-R-93-057, August 1993.

United States Environmental Protection Agency, 2002. Region 9 – Preliminary Remediation Goals (PRGs), October 2002.

TABLE 1
CHRONOLOGICAL SITE INVESTIGATIONS SUMMARY
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA

DATE	INVESTIGATING PARTY	SAMPLING DESIGN	MEDIA SAMPLED	ANALYTICAL SUITE(S)	ORGANIC CHEMICAL DETECTIONS GREATER THAN RES. PRGs(1)	SAMPLER/ DATA SOURCE
October 1998	California State Lands Commission	Random Composite	Soil	Gen Min Hydrocarbons Metals O&G PCB/Pest SVOCs VOCs	PCB Aroclor 1260 Total PCB	CH2MHill [CH2MHill, 2001] and Appendix A-3
April 1999	Hearthside	Discrete (Re-sample points used in October 1998 Composite)	Soil	PCBs	PCB Aroclor 1260	PIC [GeoSyntec, 2003]
August 1999	Hearthside	Discrete (Delineation of areas where PCB was detected in April 1999)	Soil	TRPH PCB	PCB Aroclor 1260	GeoSyntec Consultants [GeoSyntec, 2003] and Appendix A-4
October 1999	Hearthside	Discrete (Expansion of areas where PCB was detected in August 1999)	Soil	PCB	PCB Aroclor 1260	GeoSyntec Consultants [GeoSyntec, 2003] and Appendix A-4
April 2000	California State Lands Commission	Bolsa Chica Ecological Risk Assessment	Soil	Gen Min Hydrocarbons Metals O&G PCB/Pest SVOCs VOCs	None	CH2MHill [CH2MHill, 2001] and Appendix A-3
April 2001	Hearthside	Discrete (Further delineation of areas with PCB detections)	Soil	PCB	PCB Aroclor 1260	GeoSyntec Consultants [GeoSyntec, 2003] and Appendix A-4
November 2001	Hearthside	(Further delineation of areas with PCB detections and evaluation of SVOC co-location))	Soil	PCB SVOCs	PCB Aroclor 1260	GeoSyntec Consultants [GeoSyntec, 2003] and Appendix A-4

DATE	INVESTIGATING PARTY	SAMPLING DESIGN	MEDIA SAMPLED	ANALYTICAL SUITE(S)	ORGANIC CHEMICAL DETECTIONS GREATER THAN RES. PRGs(1)	DATE
September 2003 December 2003	Hearthside	Composite (Evaluate uncharacterized areas) Discrete (Further delineation of areas with PCB detections and evaluation of co-located debris piles)	Soil	PCB PAH Title 22 Metals Dioxins/Furans	PCB Aroclor 1260 Benzo[a]pyrene Dibenzo[a,h]anthracene OCDD	GeoSyntec Consultants [GeoSyntec, 2003] and Appendix A-1
October 2003	Hearthside	Grab Sample (Evaluate detectable levels of PCB and PAH in site groundwater)	Groundwater	PCB PAH	None	GeoSyntec Consultants [GeoSyntec, 2003] and Appendix A-1
TBD(2)	Hearthside	Grab Sample (Evaluate potential for PCB transport via storm water flow)	Surface Water	PCB	TBD	TBD

NOTES:

(1) Refers to the samples collected on the Fieldstone property

(2) Proposed surface water samples contingent on first rains.

Aroclor – Designated Mixture of PCB

Gen Min – General Minerals

O&G – Oil and Gas

PAH – Polycyclic aromatic hydrocarbons

PCB/Pest – Polychlorinated Biphenyls/Pesticides

RES. PRG – USEPA Region 9 Preliminary Remediation Goals for Residential Areas

SVOCs – Semi-Volatile Organic Chemical

TBD – To Be Determined

OCDD – 1,2,3,4,5,6,7,8-octachlrodibenzo-*p*-dioxin

TABLE 2
SUMMARY OF 1999 AND 2001 SOIL SAMPLING DATA
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA

Date	Sample Name	Top Depth (ft)	Bottom Depth (ft)	Analyte	Analysis	Result	Units
4/09/99	RD-47-01C	0.5	1	PCB-1260	EPA 8080A	ND < .033	mg/kg
4/09/99	RD-47-02C	0.5	1	PCB-1260	EPA 8080A	ND < .033	mg/kg
4/09/99	RD-47-04C	0.5	1	PCB-1260	EPA 8080A	0.163	mg/kg
4/09/99	RD-47-03C	0.5	1	PCB-1260	EPA 8080A	7.63	mg/kg
8/19/99	F03-4	0.5	1	PCB (153)	EPA 8080A	0.491	mg/kg
8/19/99	F03-4	0.5	1	PCB (180)	EPA 8080A	0.674	mg/kg
8/19/99	F03-4	0.5	1	PCB (187)	EPA 8080A	0.296	mg/kg
8/19/99	F03-4	0.5	1	PCB-1260	EPA 8080A	5.55	mg/kg
8/19/99	F03-12	0.5	1	PCB (153)	EPA 8080A	0.378	mg/kg
8/19/99	F03-12	0.5	1	PCB (180)	EPA 8080A	0.554	mg/kg
8/19/99	F03-12	0.5	1	PCB (187)	EPA 8080A	0.244	mg/kg
8/19/99	F03-12	0.5	1	PCB-1260	EPA 8080A	4.53	mg/kg
8/19/99	F03-19	0.5	1	PCB (180)	EPA 8080A	0.583	mg/kg
8/19/99	F03-19	0.5	1	PCB-1260	EPA 8080A	5.22	mg/kg
8/19/99	F03-24A	0.5	1	PCB (180)	EPA 8080A	0.503	mg/kg
8/19/99	F03-24A	0.5	1	PCB-1260	EPA 8080A	4.425	mg/kg
8/19/99	F03-24B	1.5	2	PCB-1260	EPA 8080A	ND < .067	mg/kg
8/19/99	F03-24C	3.5	4	PCB-1260	EPA 8080A	ND < .067	mg/kg
8/19/99	F03-24D	6	6.5	PCB-1260	EPA 8080A	ND < .067	mg/kg
8/19/99	F03-25A	0.5	1	PCB (153)	EPA 8080A	0.23	mg/kg
8/19/99	F03-25A	0.5	1	PCB (180)	EPA 8080A	0.338	mg/kg
8/19/99	F03-25A	0.5	1	PCB (187)	EPA 8080A	0.144	mg/kg
8/19/99	F03-25A	0.5	1	PCB-1260	EPA 8080A	2.77	mg/kg
8/19/99	F03-26A	0.5	1	PCB (153)	EPA 8080A	0.219	mg/kg
8/19/99	F03-26A	0.5	1	PCB (180)	EPA 8080A	0.31	mg/kg
8/19/99	F03-26A	0.5	1	PCB (187)	EPA 8080A	0.132	mg/kg
8/19/99	F03-26A	0.5	1	PCB-1260	EPA 8080A	2.54	mg/kg
8/19/99	F04-1	0.5	1	PCB (180)	EPA 8080A	0.011	mg/kg
8/19/99	F04-1	0.5	1	PCB-1260	EPA 8080A	0.092	mg/kg
8/19/99	F04-2	0.5	1	PCB (153)	EPA 8080A	0.018	mg/kg
8/19/99	F04-2	0.5	1	PCB (170)	EPA 8080A	0.014	mg/kg
8/19/99	F04-2	0.5	1	PCB (180)	EPA 8080A	0.021	mg/kg
8/19/99	F04-2	0.5	1	PCB-1260	EPA 8080A	0.178	mg/kg
8/19/99	F04-3	0.5	1	PCB (138)	EPA 8080A	0.011	mg/kg
8/19/99	F04-3	0.5	1	PCB (153)	EPA 8080A	0.031	mg/kg
8/19/99	F04-3	0.5	1	PCB (170)	EPA 8080A	0.037	mg/kg

TABLE 2 (CONTINUED)
SUMMARY OF 1999 AND 2001 SOIL SAMPLING DATA
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA

Date	Sample Name	Top Depth (ft)	Bottom Depth (ft)	Analyte	Analysis	Result	Units
8/19/99	F04-3	0.5	1	PCB (180)	EPA 8080A	0.048	mg/kg
8/19/99	F04-3	0.5	1	PCB (183)	EPA 8080A	0.01	mg/kg
8/19/99	F04-3	0.5	1	PCB (187)	EPA 8080A	0.017	mg/kg
8/19/99	F04-3	0.5	1	PCB-1260	EPA 8080A	0.366	mg/kg
8/19/99	F04-4	0.5	1	PCB (138)	EPA 8080A	0.011	mg/kg
8/19/99	F04-4	0.5	1	PCB (153)	EPA 8080A	0.031	mg/kg
8/19/99	F04-4	0.5	1	PCB (170)	EPA 8080A	0.034	mg/kg
8/19/99	F04-4	0.5	1	PCB (180)	EPA 8080A	0.05	mg/kg
8/19/99	F04-4	0.5	1	PCB (183)	EPA 8080A	0.01	mg/kg
8/19/99	F04-4	0.5	1	PCB (187)	EPA 8080A	0.018	mg/kg
8/19/99	F04-4	0.5	1	PCB-1260	EPA 8080A	0.362	mg/kg
8/19/99	F04-5	0.5	1	PCB (153)	EPA 8080A	0.028	mg/kg
8/19/99	F04-5	0.5	1	PCB (170)	EPA 8080A	0.024	mg/kg
8/19/99	F04-5	0.5	1	PCB (180)	EPA 8080A	0.036	mg/kg
8/19/99	F04-5	0.5	1	PCB (187)	EPA 8080A	0.014	mg/kg
8/19/99	F04-5	0.5	1	PCB-1260	EPA 8080A	0.281	mg/kg
8/19/99	F04-8	0.5	1	PCB (153)	EPA 8080A	0.021	mg/kg
8/19/99	F04-8	0.5	1	PCB (170)	EPA 8080A	0.02	mg/kg
8/19/99	F04-8	0.5	1	PCB (180)	EPA 8080A	0.027	mg/kg
8/19/99	F04-8	0.5	1	PCB (187)	EPA 8080A	0.01	mg/kg
8/19/99	F04-8	0.5	1	PCB-1260	EPA 8080A	0.197	mg/kg
8/19/99	F04-10	0.5	1	PCB (180)	EPA 8080A	0.013	mg/kg
8/19/99	F04-10	0.5	1	PCB-1260	EPA 8080A	0.101	mg/kg
8/19/99	F04-12	0.5	1	PCB (101)	EPA 8080A	0.012	mg/kg
8/19/99	F04-12	0.5	1	PCB (138)	EPA 8080A	0.021	mg/kg
8/19/99	F04-12	0.5	1	PCB (153)	EPA 8080A	0.053	mg/kg
8/19/99	F04-12	0.5	1	PCB (170)	EPA 8080A	0.076	mg/kg
8/19/99	F04-12	0.5	1	PCB (180)	EPA 8080A	0.099	mg/kg
8/19/99	F04-12	0.5	1	PCB (183)	EPA 8080A	0.019	mg/kg
8/19/99	F04-12	0.5	1	PCB (187)	EPA 8080A	0.036	mg/kg
8/19/99	F04-12	0.5	1	PCB-1260	EPA 8080A	0.634	mg/kg
8/19/99	F04-14	0.5	1	PCB (180)	EPA 8080A	0.012	mg/kg
8/19/99	F04-14	0.5	1	PCB-1260	EPA 8080A	0.089	mg/kg
8/19/99	F04-16	0.5	1	PCB (153)	EPA 8080A	0.015	mg/kg
8/19/99	F04-16	0.5	1	PCB (170)	EPA 8080A	0.016	mg/kg
8/19/99	F04-16	0.5	1	PCB (180)	EPA 8080A	0.022	mg/kg

TABLE 2 (CONTINUED)
SUMMARY OF 1999 AND 2001 SOIL SAMPLING DATA
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA

Date	Sample Name	Top Depth (ft)	Bottom Depth (ft)	Analyte	Analysis	Result	Units
8/19/99	F04-16	0.5	1	PCB-1260	EPA 8080A	0.162	mg/kg
8/19/99	F04-17	0.5	1	PCB (153)	EPA 8080A	0.015	mg/kg
8/19/99	F04-17	0.5	1	PCB (170)	EPA 8080A	0.016	mg/kg
8/19/99	F04-17	0.5	1	PCB (180)	EPA 8080A	0.023	mg/kg
8/19/99	F04-17	0.5	1	PCB-1260	EPA 8080A	0.162	mg/kg
8/19/99	F04-19	0.5	1	PCB (151)	EPA 8080A	0.013	mg/kg
8/19/99	F04-19	0.5	1	PCB (138)	EPA 8080A	0.022	mg/kg
8/19/99	F04-19	0.5	1	PCB (153)	EPA 8080A	0.064	mg/kg
8/19/99	F04-19	0.5	1	PCB (170)	EPA 8080A	0.06	mg/kg
8/19/99	F04-19	0.5	1	PCB (180)	EPA 8080A	0.081	mg/kg
8/19/99	F04-19	0.5	1	PCB (183)	EPA 8080A	0.021	mg/kg
8/19/99	F04-19	0.5	1	PCB (187)	EPA 8080A	0.034	mg/kg
8/19/99	F04-19	0.5	1	PCB-1260	EPA 8080A	0.66	mg/kg
8/19/99	F04-20	0.5	1	PCB (151)	EPA 8080A	0.013	mg/kg
8/19/99	F04-20	0.5	1	PCB (138)	EPA 8080A	0.02	mg/kg
8/19/99	F04-20	0.5	1	PCB (153)	EPA 8080A	0.072	mg/kg
8/19/99	F04-20	0.5	1	PCB (170)	EPA 8080A	0.052	mg/kg
8/19/99	F04-20	0.5	1	PCB (180)	EPA 8080A	0.081	mg/kg
8/19/99	F04-20	0.5	1	PCB (183)	EPA 8080A	0.018	mg/kg
8/19/99	F04-20	0.5	1	PCB (187)	EPA 8080A	0.032	mg/kg
8/19/99	F04-20	0.5	1	PCB-1260	EPA 8080A	0.654	mg/kg
8/19/99	F04-22	0.5	1	PCB (101)	EPA 8080A	0.01	mg/kg
8/19/99	F04-22	0.5	1	PCB (138)	EPA 8080A	0.01	mg/kg
8/19/99	F04-22	0.5	1	PCB (153)	EPA 8080A	0.046	mg/kg
8/19/99	F04-22	0.5	1	PCB (170)	EPA 8080A	0.03	mg/kg
8/19/99	F04-22	0.5	1	PCB (180)	EPA 8080A	0.047	mg/kg
8/19/99	F04-22	0.5	1	PCB (183)	EPA 8080A	0.011	mg/kg
8/19/99	F04-22	0.5	1	PCB (187)	EPA 8080A	0.02	mg/kg
8/19/99	F04-22	0.5	1	PCB-1260	EPA 8080A	0.393	mg/kg
8/19/99	F04-23	0.5	1	PCB (138)	EPA 8080A	0.011	mg/kg
8/19/99	F04-23	0.5	1	PCB (153)	EPA 8080A	0.031	mg/kg
8/19/99	F04-23	0.5	1	PCB (170)	EPA 8080A	0.03	mg/kg
8/19/99	F04-23	0.5	1	PCB (180)	EPA 8080A	0.044	mg/kg
8/19/99	F04-23	0.5	1	PCB (187)	EPA 8080A	0.016	mg/kg
8/19/99	F04-23	0.5	1	PCB-1260	EPA 8080A	0.314	mg/kg
8/19/99	F04-24A	0.5	1	PCB (101)	EPA 8080A	0.013	mg/kg

TABLE 2 (CONTINUED)
SUMMARY OF 1999 AND 2001 SOIL SAMPLING DATA
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA

Date	Sample Name	Top Depth (ft)	Bottom Depth (ft)	Analyte	Analysis	Result	Units
8/19/99	F04-24A	0.5	1	PCB (138)	EPA 8080A	0.014	mg/kg
8/19/99	F04-24A	0.5	1	PCB (151)	EPA 8080A	0.011	mg/kg
8/19/99	F04-24A	0.5	1	PCB (153)	EPA 8080A	0.037	mg/kg
8/19/99	F04-24A	0.5	1	PCB (180)	EPA 8080A	0.042	mg/kg
8/19/99	F04-24A	0.5	1	PCB (183)	EPA 8080A	0.011	mg/kg
8/19/99	F04-24A	0.5	1	PCB (187)	EPA 8080A	0.018	mg/kg
8/19/99	F04-24A	0.5	1	PCB-1260	EPA 8080A	2.03	mg/kg
8/19/99	F04-24B	1.5	2	PCB-1260	EPA 8080A	ND < .067	mg/kg
8/19/99	F04-24C	3.5	4	PCB-1260	EPA 8080A	ND < .067	mg/kg
8/19/99	F04-24D	6	6.5	PCB-1260	EPA 8080A	ND < .067	mg/kg
8/19/99	F04-25A	0.5	1	PCB (101)	EPA 8080A	0.011	mg/kg
8/19/99	F04-25A	0.5	1	PCB (138)	EPA 8080A	0.019	mg/kg
8/19/99	F04-25A	0.5	1	PCB (151)	EPA 8080A	0.011	mg/kg
8/19/99	F04-25A	0.5	1	PCB (153)	EPA 8080A	0.053	mg/kg
8/19/99	F04-25A	0.5	1	PCB (170)	EPA 8080A	0.068	mg/kg
8/19/99	F04-25A	0.5	1	PCB (180)	EPA 8080A	0.085	mg/kg
8/19/99	F04-25A	0.5	1	PCB (183)	EPA 8080A	0.018	mg/kg
8/19/99	F04-25A	0.5	1	PCB (187)	EPA 8080A	0.03	mg/kg
8/19/99	F04-25A	0.5	1	PCB-1260	EPA 8080A	0.651	mg/kg
8/19/99	F04-26A	0.5	1	PCB (153)	EPA 8080A	0.02	mg/kg
8/19/99	F04-26A	0.5	1	PCB (180)	EPA 8080A	0.022	mg/kg
8/19/99	F04-26A	0.5	1	PCB-1260	EPA 8080A	0.211	mg/kg
8/19/99	F04-27A	0.5	1	PCB (153)	EPA 8080A	0.014	mg/kg
8/19/99	F04-27A	0.5	1	PCB (180)	EPA 8080A	0.015	mg/kg
8/19/99	F04-27A	0.5	1	PCB-1260	EPA 8080A	0.139	mg/kg
8/19/99	F04-27B	1.5	2	PCB-1260	EPA 8080A	ND < .067	mg/kg
8/19/99	F04-27C	3.5	4	PCB-1260	EPA 8080A	ND < .067	mg/kg
8/19/99	F04-27D	6	6.5	PCB-1260	EPA 8080A	ND < .067	mg/kg
8/19/99	F03-4	0.5	1	TRPH	EPA 418.1	207	mg/kg
8/19/99	F03-12	0.5	1	TRPH	EPA 418.1	208	mg/kg
8/19/99	F03-19	0.5	1	TRPH	EPA 418.1	20	mg/kg
8/19/99	F03-24A	0.5	1	TRPH	EPA 418.1	145	mg/kg
8/19/99	F03-24B	1.5	2	TRPH	EPA 418.1	ND < 10	mg/kg
8/19/99	F03-24C	3.5	4	TRPH	EPA 418.1	ND < 10	mg/kg
8/19/99	F03-24D	6	6.5	TRPH	EPA 418.1	ND < 10	mg/kg
8/19/99	F03-25A	0.5	1	TRPH	EPA 418.1	42	mg/kg

TABLE 2 (CONTINUED)
SUMMARY OF 1999 AND 2001 SOIL SAMPLING DATA
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA

Date	Sample Name	Top Depth (ft)	Bottom Depth (ft)	Analyte	Analysis	Result	Units
8/19/99	F04-24A	0.5	1	PCB (138)	EPA 8080A	0.014	mg/kg
8/19/99	F04-24A	0.5	1	PCB (151)	EPA 8080A	0.011	mg/kg
8/19/99	F04-24A	0.5	1	PCB (153)	EPA 8080A	0.037	mg/kg
8/19/99	F04-24A	0.5	1	PCB (180)	EPA 8080A	0.042	mg/kg
8/19/99	F04-24A	0.5	1	PCB (183)	EPA 8080A	0.011	mg/kg
8/19/99	F04-24A	0.5	1	PCB (187)	EPA 8080A	0.018	mg/kg
8/19/99	F04-24A	0.5	1	PCB-1260	EPA 8080A	2.03	mg/kg
8/19/99	F04-24B	1.5	2	PCB-1260	EPA 8080A	ND < .067	mg/kg
8/19/99	F04-24C	3.5	4	PCB-1260	EPA 8080A	ND < .067	mg/kg
8/19/99	F04-24D	6	6.5	PCB-1260	EPA 8080A	ND < .067	mg/kg
8/19/99	F04-25A	0.5	1	PCB (101)	EPA 8080A	0.011	mg/kg
8/19/99	F04-25A	0.5	1	PCB (138)	EPA 8080A	0.019	mg/kg
8/19/99	F04-25A	0.5	1	PCB (151)	EPA 8080A	0.011	mg/kg
8/19/99	F04-25A	0.5	1	PCB (153)	EPA 8080A	0.053	mg/kg
8/19/99	F04-25A	0.5	1	PCB (170)	EPA 8080A	0.068	mg/kg
8/19/99	F04-25A	0.5	1	PCB (180)	EPA 8080A	0.085	mg/kg
8/19/99	F04-25A	0.5	1	PCB (183)	EPA 8080A	0.018	mg/kg
8/19/99	F04-25A	0.5	1	PCB (187)	EPA 8080A	0.03	mg/kg
8/19/99	F04-25A	0.5	1	PCB-1260	EPA 8080A	0.651	mg/kg
8/19/99	F04-26A	0.5	1	PCB (153)	EPA 8080A	0.02	mg/kg
8/19/99	F04-26A	0.5	1	PCB (180)	EPA 8080A	0.022	mg/kg
8/19/99	F04-26A	0.5	1	PCB-1260	EPA 8080A	0.211	mg/kg
8/19/99	F04-27A	0.5	1	PCB (153)	EPA 8080A	0.014	mg/kg
8/19/99	F04-27A	0.5	1	PCB (180)	EPA 8080A	0.015	mg/kg
8/19/99	F04-27A	0.5	1	PCB-1260	EPA 8080A	0.139	mg/kg
8/19/99	F04-27B	1.5	2	PCB-1260	EPA 8080A	ND < .067	mg/kg
8/19/99	F04-27C	3.5	4	PCB-1260	EPA 8080A	ND < .067	mg/kg
8/19/99	F04-27D	6	6.5	PCB-1260	EPA 8080A	ND < .067	mg/kg
8/19/99	F03-4	0.5	1	TRPH	EPA 418.1	207	mg/kg
8/19/99	F03-12	0.5	1	TRPH	EPA 418.1	208	mg/kg
8/19/99	F03-19	0.5	1	TRPH	EPA 418.1	20	mg/kg
8/19/99	F03-24A	0.5	1	TRPH	EPA 418.1	145	mg/kg
8/19/99	F03-24B	1.5	2	TRPH	EPA 418.1	ND < 10	mg/kg
8/19/99	F03-24C	3.5	4	TRPH	EPA 418.1	ND < 10	mg/kg
8/19/99	F03-24D	6	6.5	TRPH	EPA 418.1	ND < 10	mg/kg
8/19/99	F03-25A	0.5	1	TRPH	EPA 418.1	42	mg/kg

TABLE 2 (CONTINUED)
SUMMARY OF 1999 AND 2001 SOIL SAMPLING DATA
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA

Date	Sample Name	Top Depth (ft)	Bottom Depth (ft)	Analyte	Analysis	Result	Units
10/22/99	F03-39	0.5	1	PCB-1260	EPA 8082	26	mg/kg
10/22/99	F03-40	0.5	1	PCB-1260	EPA 8082	25.6	mg/kg
10/22/99	F03-41	0.5	1	PCB-1260	EPA 8082	374	mg/kg
10/22/99	F03-42	0.5	1	PCB-1260	EPA 8082	3220	mg/kg
10/22/99	F04-29	0.5	1	PCB-1260	EPA 8082	0.836	mg/kg
10/22/99	F04-30	0.5	1	PCB-1260	EPA 8082	0.273	mg/kg
10/22/99	F04-33	0.5	1	PCB-1260	EPA 8082	ND < .067	mg/kg
10/22/99	F04-34	0.5	1	PCB-1260	EPA 8082	0.439	mg/kg
10/22/99	F04-35	0.5	1	PCB-1260	EPA 8082	0.278	mg/kg
10/22/99	F04-38	0.5	1	PCB-1260	EPA 8082	0.127	mg/kg
10/22/99	F04-39	0.5	1	PCB-1260	EPA 8082	0.184	mg/kg
10/22/99	F04-40	0.5	1	PCB-1260	EPA 8082	0.162	mg/kg
10/22/99	F04-41	0.5	1	PCB-1260	EPA 8082	0.337	mg/kg
10/22/99	F04-42	0.5	1	PCB-1260	EPA 8082	0.14	mg/kg
10/22/99	F04-43	0.5	1	PCB-1260	EPA 8082	1.14	mg/kg
10/22/99	F04-44	0.5	1	PCB-1260	EPA 8082	0.554	mg/kg
10/22/99	F04-45	0.5	1	PCB-1260	EPA 8082	0.28	mg/kg
10/22/99	F04-46	0.5	1	PCB-1260	EPA 8082	0.5	mg/kg
10/22/99	F04-48	0.5	1	PCB-1260	EPA 8082	15.1	mg/kg
10/22/99	F04-49	0.5	1	PCB-1260	EPA 8082	1.16	mg/kg
10/22/99	F04-50	0.5	1	PCB-1260	EPA 8082	1.11	mg/kg
10/22/99	F04-52	0.5	1	PCB-1260	EPA 8082	0.508	mg/kg
10/22/99	F04-53	0.5	1	PCB-1260	EPA 8082	0.327	mg/kg
10/22/99	F04-54	0.5	1	PCB-1260	EPA 8082	0.103	mg/kg
10/22/99	F04-55	0.5	1	PCB-1260	EPA 8082	0.251	mg/kg
10/22/99	F04-58	0.5	1	PCB-1260	EPA 8082	0.066	mg/kg
10/22/99	F04-61	0.5	1	PCB-1260	EPA 8082	0.136	mg/kg
4/26/01	F05-1A	0.5	1	PCB-1260	EPA 8080A	16	mg/kg
4/26/01	F05-1B	1.5	2	PCB-1260	EPA 8080A	4.5	mg/kg
4/26/01	F05-2A	0.5	1	PCB-1260	EPA 8080A	ND < .067	mg/kg
4/26/01	F05-2B	1.5	2	PCB-1260	EPA 8080A	ND < .067	mg/kg
4/26/01	F05-3A	0.5	1	PCB-1260	EPA 8080A	80	mg/kg
4/26/01	F05-3B	1.5	2	PCB-1260	EPA 8080A	0.097	mg/kg
4/26/01	F05-4A	0.5	1	PCB-1260	EPA 8080A	13	mg/kg
4/26/01	F05-4B	1.5	2	PCB-1260	EPA 8080A	0.059	mg/kg
4/26/01	F05-5A	0.5	1	PCB-1260	EPA 8080A	220	mg/kg

TABLE 2 (CONTINUED)
SUMMARY OF 1999 AND 2001 SOIL SAMPLING DATA
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA

Date	Sample Name	Top Depth (ft)	Bottom Depth (ft)	Analyte	Analysis	Result	Units
4/26/01	F05-5B	1.5	2	PCB-1260	EPA 8080A	0.42	mg/kg
4/26/01	F05-6A	0.5	1	PCB-1260	EPA 8080A	620	mg/kg
4/26/01	F05-6B	1.5	2	PCB-1260	EPA 8080A	3.8	mg/kg
4/26/01	F05-7A	0.5	1	PCB-1260	EPA 8080A	55	mg/kg
4/26/01	F05-7B	1.5	2	PCB-1260	EPA 8080A	ND < .001	mg/kg
4/26/01	F05-8A	0.5	1	PCB-1260	EPA 8080A	69	mg/kg
4/26/01	F05-8B	1.5	2	PCB-1260	EPA 8080A	0.84	mg/kg
4/26/01	F05-9A	0.5	1	PCB-1260	EPA 8080A	120	mg/kg
4/26/01	F05-9B	1.5	2	PCB-1260	EPA 8080A	0.2	mg/kg
4/26/01	F05-10A	0.5	1	PCB-1260	EPA 8080A	19	mg/kg
4/26/01	F05-10B	1.5	2	PCB-1260	EPA 8080A	0.12	mg/kg
4/26/01	F05-11A	0.5	1	PCB-1260	EPA 8080A	130	mg/kg
4/26/01	F05-11B	1.5	2	PCB-1260	EPA 8080A	0.21	mg/kg
4/26/01	F05-12A	0.5	1	PCB-1260	EPA 8080A	430	mg/kg
4/26/01	F05-12B	1.5	2	PCB-1260	EPA 8080A	8.5	mg/kg
11/21/01	F05-13A	0.5	1	PCB-1260	EPA 8082	67	mg/kg
11/21/01	F05-14A	0.5	1	PCB-1260	EPA 8082	3.8	mg/kg
11/21/01	F05-15A	0.5	1	PCB-1260	EPA 8082	440	mg/kg
11/21/01	F05-16A	0.5	1	PCB-1260	EPA 8082	69	mg/kg
11/21/01	F05-16B	1.5	2	PCB-1260	EPA 8082	0.3	mg/kg
11/21/01	F05-17A	0.5	1	PCB-1260	EPA 8082	0.085	mg/kg
11/21/01	F05-17B	1.5	2	PCB-1260	EPA 8082	ND < .001	mg/kg
11/21/01	F05-18A	0.5	1	PCB-1260	EPA 8082	0.76	mg/kg
11/21/01	F05-19A	0.5	1	PCB-1260	EPA 8082	0.35	mg/kg
11/21/01	F05-19B	1.5	2	PCB-1260	EPA 8082	ND < .001	mg/kg
11/21/01	F05-20A	0.5	1	PCB-1260	EPA 8082	ND < .001	mg/kg
11/21/01	F05-20B	1.5	2	PCB-1260	EPA 8082	ND < .001	mg/kg
11/21/01	F05-43A	0.5	1	PCB-1260	EPA 8082	27	mg/kg
11/21/01	F05-43B	1.5	2	PCB-1260	EPA 8082	58	mg/kg
11/21/01	F05-44A	0.5	1	PCB-1260	EPA 8082	750	mg/kg
11/21/01	F05-44B	1.5	2	PCB-1260	EPA 8082	540	mg/kg
11/21/01	F05-45A	0.5	1	PCB-1260	EPA 8082	1.4	mg/kg
11/21/01	F05-46A	0.5	1	PCB-1260	EPA 8082	27	mg/kg
11/21/01	F05-47A	0.5	1	PCB-1260	EPA 8082	0.17	mg/kg
11/21/01	F05-48A	0.5	1	PCB-1260	EPA 8082	0.21	mg/kg
11/21/01	F05-49A	0.5	1	PCB-1260	EPA 8082	2	mg/kg

TABLE 2 (CONTINUED)
SUMMARY OF 1999 AND 2001 SOIL SAMPLING DATA
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA

Date	Sample Name	Top Depth (ft)	Bottom Depth (ft)	Analyte	Analysis	Result	Units
11/21/01	F05-49B	1.5	2	PCB-1260	EPA 8082	0.066	mg/kg
11/21/01	F05-49C	3.5	4	PCB-1260	EPA 8082	0.043	mg/kg
11/21/01	F05-50A	0.5	1	PCB-1260	EPA 8082	0.54	mg/kg
11/21/01	F05-51A	0.5	1	PCB-1260	EPA 8082	1.5	mg/kg
11/21/01	F05-43A	0.5	1	TRPH	EPA 418.1	320	mg/kg
11/21/01	F05-43B	1.5	2	TRPH	EPA 418.1	710	mg/kg
11/21/01	F05-44A	0.5	1	TRPH	EPA 418.1	2300	mg/kg
11/21/01	F05-44B	1.5	2	TRPH	EPA 418.1	890	mg/kg
11/21/01	F05-45A	0.5	1	TRPH	EPA 418.1	210	mg/kg
11/21/01	F05-49A	0.5	1	TRPH	EPA 418.1	220	mg/kg
11/21/01	F05-49B	1.5	2	TRPH	EPA 418.1	190	mg/kg
11/21/01	F05-43A	0.5	1	SVOC	EPA 8270C	ND < .005	mg/kg
11/21/01	F05-43B	1.5	2	SVOC	EPA 8270C	ND < .005	mg/kg
11/21/01	F05-44A	0.5	1	SVOC	EPA 8270C	ND < .005	mg/kg
11/21/01	F05-44B	1.5	2	SVOC	EPA 8270C	ND < .005	mg/kg
11/21/01	F05-45A	0.5	1	SVOC	EPA 8270C	ND < .005	mg/kg
11/21/01	F05-49A	0.5	1	SVOC	EPA 8270C	ND < .005	mg/kg
11/21/01	F05-49B	1.5	2	SVOC	EPA 8270C	ND < .005	mg/kg

Notes:
(1) Method Detection Limits for PCBs ranged between 0.001 mg/kg and 0.067 mg/kg.
ND – Not Detected
PCB – Polychlorinated Biphenyl
TRPH – Total Recoverable Petroleum Hydrocarbon
SVOC-Semi-volatile Organic Compound
mg/kg – milligrams per kilogram

TABLE 3
SUMMARY OF 2003 SOIL SAMPLING DATA
POLYCHLORINATED BIPHENYL (PCB)
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA

Sample Name	Discrete/ Composite	Sample Depth	Sample Date	PCB-1260 (mg/kg)
SS-97-A (D)	Discrete	0 - 0.5	09/17/03	**0.01**
SS-102-C	Discrete	4 - 4.5	09/16/03	**0.011**
SS-104-A	Discrete	0 - 0.5	09/16/03	**0.018**
SS-104-C	Discrete	4 - 4.5	09/16/03	**0.011**
SS-117-A	Discrete	0 - 0.5	09/17/03	**0.014**
SS-120-A	Discrete	0 - 0.5	09/17/03	**13**
SS-121-A	Discrete	0 - 0.5	09/16/03	**0.01**
SS-123-A	Discrete	0 - 0.5	09/10/03	**0.023**
SS-125-A	Discrete	0 - 0.5	09/11/03	**0.059**
SS-127-C	Discrete	4 - 4.5	09/08/03	**0.073**
SS-130-A	Discrete	0 - 0.5	09/16/03	**0.01**
SS-134-A	Discrete	0 - 0.5	09/17/03	**17**
SS-134-B	Discrete	2 - 2.5	09/17/03	**0.055**
SS-134-C	Discrete	4 - 4.5	09/17/03	**1.4**
SS-142-A	Discrete	0 - 0.5	12/23/03	**0.019**
SS-144-A	Discrete	0 - 0.5	12/23/03	**0.076**
SS-145-A	Discrete	0 - 0.5	12/23/03	**0.01**
SS-146-A	Discrete	0 - 0.5	12/23/03	**0.012**
SS-148-A	Discrete	0 - 0.5	12/23/03	**0.011**
SS-148-A(D)	Discrete	0 - 0.5	12/23/03	**0.025**
SS-149-A	Discrete	0 - 0.5	12/23/03	**0.011**
SS-150-A	Discrete	0 - 0.5	12/23/03	**0.03**
SS-150-B	Discrete	0.5 - 1.0	12/23/03	**0.027**
SS-151-A	Discrete	0 - 0.5	12/23/03	**4.8**
SS-151-A(S)	Discrete	0 - 0.5	12/23/03	**10**
SS-151-B	Discrete	0.5 - 1.0	12/23/03	**0.046**
SS-151-E	Discrete	2.0 - 2.5	12/23/03	**0.013**
SS-152-A	Discrete	0 - 0.5	12/23/03	**25**
SS-153-A	Discrete	0 - 0.5	12/23/03	**0.059**
SS-154-A	Discrete	0 - 0.5	12/23/03	**2**
SS-155-A	Discrete	0 - 0.5	12/23/03	**0.9**
SS-156-A	Discrete	0 - 0.5	12/23/03	**0.69**
SS-156-B	Discrete	0.5 - 1.0	12/23/03	**0.086**
SS-156-E	Discrete	2.0 - 2.5	12/23/03	**0.21**
SS-157-A	Discrete	0 - 0.5	12/23/03	**0.12**
SS-157-B	Discrete	0.5 - 1.0	12/23/03	**1.3**
SS-158-A	Discrete	0 - 0.5	12/23/03	**0.28**
SS-158-B	Discrete	0.5 - 1.0	12/23/03	**0.18**
SS-158-E	Discrete	2.0 - 2.5	12/23/03	**0.056**

NOTES
mg/kg - milligrams per kilogram
Detections greater than 0.25 mg/kg are highlighted.
USEPA Region 9 Industrial PRG for PCB-1260 - 0.74 mg/kg [EPA, 2002]
USEPA Region 9 Residential PRG for Total PCBs - 0.22 mg/kg [EPA, 2002]

TABLE 3 (CONTINUED)
SUMMARY OF 2003 SOIL SAMPLING DATA
POLYCHLORINATED BIPHENYL (PCB)
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA

Sample Name	Discrete/ Composite	Sample Depth	Sample Date	PCB-1260 (mg/kg)
SS-160-A	Discrete	0 - 0.5	12/23/03	**1.2**
SS-160-A(D)	Discrete	0 - 0.5	12/23/03	**0.14**
SS-160-B	Discrete	0.5 - 1.0	12/23/03	**0.65**
SS-160-E	Discrete	2.0 - 2.5	12/23/03	**0.014**
SS-161-A	Discrete	0 - 0.5	12/23/03	**110**
SS-161-A(S)	Discrete	0 - 0.5	12/23/03	**140**
SS-161-B	Discrete	0.5 - 1.0	12/23/03	**5.1**
SS-161-C	Discrete	1.0 - 1.5	12/23/03	**0.16**
SS-161-D	Discrete	1.5 - 2.0	12/23/03	**0.77**
SS-161-E	Discrete	2.0 - 2.5	12/23/03	**0.1**
SS-162-A	Discrete	0 - 0.5	12/23/03	**65**
SS-162-A(D)	Discrete	0 - 0.5	12/23/03	**53**
SS-162-B	Discrete	0.5 - 1.0	12/23/03	**9.5**
SS-162-C	Discrete	1.0 - 1.5	12/23/03	**0.081**
SS-162-D	Discrete	1.5 - 2.0	12/23/03	**0.043**
SS-162-E	Discrete	2.0 - 2.5	12/23/03	**0.63**
SS-163-A	Discrete	0 - 0.5	12/23/03	**0.61**
SS-163-B	Discrete	0.5 - 1.0	12/23/03	**0.22**
SS-163-C	Discrete	1.0 - 1.5	12/23/03	**0.15**
SS-163-D	Discrete	1.5 - 2.0	12/23/03	**0.046**
SS-163-E	Discrete	2.0 - 2.5	12/23/03	**0.088**
SS-164-A	Discrete	0 - 0.5	12/23/03	**4.3**
SS-164-B	Discrete	0.5 - 1.0	12/23/03	**0.28**
SS-164-C	Discrete	1.0 - 1.5	12/23/03	**0.058**
SS-164-D	Discrete	1.5 - 2.0	12/23/03	**0.027**
SS-164-E	Discrete	2.0 - 2.5	12/23/03	**0.018**
SS-165-A	Discrete	0 - 0.5	12/23/03	**0.16**
SS-165-B	Discrete	0.5 - 1.0	12/23/03	**4.7**
SS-165-C	Discrete	1.0 - 1.5	12/23/03	**0.21**
SS-165-D	Discrete	1.5 - 2.0	12/23/03	**0.37**
SS-165-E	Discrete	2.0 - 2.5	12/23/03	**0.041**
SS-166-A	Discrete	0 - 0.5	12/23/03	**590**
SS-166-A(D)	Discrete	0 - 0.5	12/23/03	**100**
SS-166-B	Discrete	0.5 - 1.0	12/23/03	**48**
SS-166-B(S)	Discrete	0.5 - 1.0	12/23/03	**57**
SS-166-C	Discrete	1.0 - 1.5	12/23/03	**19**
SS-166-D	Discrete	1.5 - 2.0	12/23/03	**0.26**
SS-166-E	Discrete	2.0 - 2.5	12/23/03	**0.075**
SS-167-A	Discrete	0 - 0.5	12/23/03	**120**
SS-167-B	Discrete	0.5 - 1.0	12/23/03	**1.3**

NOTES
mg/kg - milligrams per kilogram
Detections greater than 0.18 mg/kg are highlighted.
USEPA Region 9 Industrial PRG for PCB-1260 - 0.74 mg/kg [EPA, 2002]
USEPA Region 9 Residential PRG for Total PCBs - 0.22 mg/kg [EPA, 2002]

TABLE 3 (CONTINUED)
SUMMARY OF 2003 SOIL SAMPLING DATA
POLYCHLORINATED BIPHENYL (PCB)
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA

Sample Name	Discrete/ Composite	Sample Depth	Sample Date	PCB-1260 (mg/kg)
SS-167-E	Discrete	2.0 - 2.5	12/23/03	**0.038**
SS-168-A	Discrete	0 - 0.5	12/23/03	**52**
SS-168-B	Discrete	0.5 - 1.0	12/23/03	**8.3**
SS-168-E	Discrete	2.0 - 2.5	12/23/03	**0.021**
SS-169-A	Discrete	0 - 0.5	12/23/03	**0.22**
SS-169-E	Discrete	2.0 - 2.5	12/23/03	**0.46**
SS-170-A(S)	Discrete	0 - 0.5	12/23/03	**0.052**
SS-172-A	Discrete	0 - 0.5	12/23/03	**0.34**
SS-172-D	Discrete	1.5 - 2.0	12/23/03	**0.013**
SS-172-E	Discrete	2.0 - 2.5	12/23/03	**0.013**
SS-173	Asphalt Only	Surface	12/23/03	**2.4**
SS-89-A	Discrete	0 - 0.5	09/17/03	**25**
SS-89-A (S)	Discrete	0 - 0.5	09/17/03	**60**
SS-89-B	Discrete	2 - 2.5	09/17/03	**0.044**
SS-89-B (S)	Discrete	2 - 2.5	09/17/03	**0.19**
SS-89-C	Discrete	4 - 4.5	09/17/03	**0.3**
SS-90-A	Discrete	0 - 0.5	09/17/03	**41**
SS-90-A (S)	Discrete	0 - 0.5	09/17/03	**55**
SS-90-B	Discrete	2 - 2.5	09/17/03	**0.21**
SS-90-B (S)	Discrete	2 - 2.5	09/17/03	**0.3**
SS-90-C	Discrete	4 - 4.5	09/17/03	**0.1**
SS-91-A	Discrete	0 - 0.5	09/17/03	**53**
SS-91-A (S)	Discrete	0 - 0.5	09/17/03	**100**
SS-91-B	Discrete	2 - 2.5	09/17/03	**10**
SS-91-B (S)	Discrete	2 - 2.5	09/17/03	**35**
SS-91-C	Discrete	4 - 4.5	09/17/03	**0.67**
SS-91-D	Discrete	6 - 6.5	09/17/03	**0.035**
SS-92-A	Discrete	0 - 0.5	09/17/03	**0.53**
SS-92-A (S)	Discrete	0 - 0.5	09/17/03	**0.6**
SS-92-B	Discrete	2 - 2.5	09/17/03	**0.029**
SS-92-B (S)	Discrete	2 - 2.5	09/17/03	**0.11**
SS-93-A	Discrete	0 - 0.5	09/17/03	**12**
SS-93-A (S)	Discrete	0 - 0.5	09/17/03	**19**
SS-93-B	Discrete	2 - 2.5	09/17/03	**0.53**
SS-93-B (S)	Discrete	2 - 2.5	09/17/03	**2.6**
SS-93-C	Discrete	4 - 4.5	09/17/03	**0.21**
SS-93-D	Discrete	6 - 6.5	09/17/03	**0.05**
SS-94-A	Discrete	0 - 0.5	09/17/03	**0.78**
SS-94-A (S)	Discrete	0 - 0.5	09/17/03	**1.2**
SS-94-C	Discrete	4 - 4.5	09/17/03	**0.51**
SS-95-A	Discrete	0 - 0.5	09/17/03	**0.041**

NOTES
mg/kg - milligrams per kilogram
Detections greater than 0.25 mg/kg are highlighted.
USEPA Region 9 Industrial PRG for PCB-1260 - 0.74 mg/kg [EPA, 2002]
USEPA Region 9 Residential PRG for Total PCBs - 0.22 mg/kg [EPA, 2002]

TABLE 4

POTENTIALLY APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)
FIELDSTONE PROPERTY
ORANGE COUNTY CALIFORNIA

Standard, Requirement, Criteria, Limitation	Citation	Description	Type of ARARs
Federal			
Clean Air Act	42 United States Code (USC) 7401-7642	Emission Standards from stationary and mobile sources	Chemical
Hazardous Waste Identification	40 Code of Federal Regulations (CFR) 261.24	Establishes criteria to determine whether solid waste exhibits hazard characteristics of toxicity	Chemical
National Primary and Secondary Ambient Air Quality Standards (NAAQS)	40 CFR Part 150	Establishes NAAQS for criteria pollutants: particulate matter (PM_{10}), sulfur dioxide, carbon monoxide, nitrogen dioxide, ozone, and lead.	Chemical
Hazardous Materials Transportation, Marking, Labeling and Placarding	US Department of Transportation (DOT) 49 USC 1802, et seq. and 49 CFR 171 & 172	Provides standards for marking, labeling, placarding, and transportation of waste.	Action
Occupational Health and Safety	29 CFR 1910.120	Establishes requirements for health and safety training	Action
Transport of Hazardous Waste	40 CFR 263	Standards applicable to transporters of hazardous waste	Action
Coastal Zone Management Act	16 USC 1451-1464	Activities within the coastal zone must be conducted with approved state management programs	Action
Endangered Species Act of 1973	16 USC 1131-1543	Requires determination of the effect on endangered or threatened wildlife or its habitat	Action

TABLE 4 (CONTINUED)

POTENTIALLY APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)
FIELDSTONE PROPERTY
ORANGE COUNTY CALIFORNIA

Standard, Requirement, Criteria, Limitation	Citation	Description	Type of ARARs
Migratory Bird Treaty Act of 1972	16 USC 703-712	Requires protection of almost all species of native migratory birds	Action
Toxic Substances Control Act	40 CFR 761.61	Establishes PCB cleanup numbers and remediation waste disposal procedures	Chemical/ Action
USEPA "Superfund" Program	Comprehensive, Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) (US 1986). Part of the National Contingency Plan (NCP; US 1994)	CERCLA provides federal authority to respond to abandoned or uncontrolled hazardous waste disposal sites as well as to incidents involving hazardous substances. CERCLA provides for liability, compensation, cleanup, and emergency response in connection with cleanup of these "superfund" sites.	Chemical/ Action
Resource Conservation and Recovery Act (RCRA)	42 USC 6901 et seq. 40 CFR 260-268	Classifies and regulates hazardous wastes and facilities which treat, store and dispose of hazardous materials.	Chemical/ Action
Health Risk Assessment	US EPA, Risk Assessment Guidance for Superfund, 1989	Guidance and framework to assess health risk	TBC
State and Local			
Determination of Characteristic Wastes	22 California Code of Regulations (CCR) 66261.24	Establishes criteria for identifying characteristic wastes.	Chemical
Ambient Air Quality Standards	Health and Safety Code (H&SC) Section 39000-44071	Establishes standards for emissions of chemical vapors and dust	Chemical
Hazardous Waste Control	H&SC Chapter 6.5, Sec. 25100-25250.26	Establishes hazardous waste control measures	Action

TABLE 4 (CONTINUED)

POTENTIALLY APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)
FIELDSTONE PROPERTY
ORANGE COUNTY CALIFORNIA

Standard, Requirement, Criteria, Limitation	Citation	Description	Type of ARARs
Hazardous Waste Generator Requirements	22 CCR 66262.11 et seq.	Establishes standards applicable to generators of hazardous waste	Action
Transportation of Hazardous Waste	22 CCR Chapter 13	Governs transportation of hazardous materials	Action
Occupational Health and Safety	8 CCR Sections 1500, 2300, and 3200 et seq.	Establishes standards for working conditions and employees matter; and notification requirements.	Action
State and Local			
Environmental Impact Review	Public Resources Code Section 21000-21177	Mandates environmental impact review of projects approved by governmental agencies	Action
Hazardous Substances Account Act	H&SC, Chapter 6.8, Sections 25300-25395.15	Establishes site mitigation and cost recovery programs	Action
DTSC Site Mitigation Program Policies and Procedures	DTSC	Applicable policies, procedures, management memos and related guidance documents.	Action
Toxics Pits Cleanup Act	H&SC, Section 25208	Authorizes the Regional Water Quality Control Board to regulate surface impoundments containing hazardous waste.	Action
Standards for Discharges of Waste to Land	Title 23 CCR, Division 3, Chapter 15, Article 1, Section 2511(d) and Articles 2, 8, and 9.	Exempts from Chapter 15 any actions taken by a public agency to cleanup waste, provided that waste removed from place of release shall be discharged according to the Article 2.	Action
South Coast Air Quality Management District	Rules 403 and 404	Establishes fugitive dust/particulate emissions requirements from any source	Action
Porter-Cologne Water Quality	Title 23 CCR, Division 3, Chapter 15, Article 2; Waste Classification	Establishes/defines procedures and criteria for	Chemical/

TABLE 4 (CONTINUED)

POTENTIALLY APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS (ARARs)
FIELDSTONE PROPERTY
ORANGE COUNTY CALIFORNIA

Standard, Requirement, Criteria, Limitation	Citation	Description	Type of ARARs
Control Act	and Management	classification and management of waste.	Action
Determination of Hazardous Waste	22 CCR 66260.1 et seq.	Establishes criteria for determining waste classification for the purposes of transportation and disposal of wastes	Chemical/ Action
Land Disposal Restrictions	22 CCR Chapter 18	Identifies hazardous waste restricted from land disposal unless specific treatment standards are met	Chemical/ Action
Land Use Covenants	22 CCR Chapter 39, Division 4.5, Section 67391.1	Specifies that a land use covenant imposing appropriate limitations on land use shall be executed and recorded when hazardous materials, hazardous wastes or constituents, or hazardous substances will remain at the property at levels which are not suitable for unrestricted use of the land.	Action
Stockpiling Requirements for Contaminated Soil	H&SC Section 25123.3(a)(20)	Establishes standards for stockpiling of non-RCRA contaminated soil	Action

TABLE 5
ALTERNATIVE 2 COST ESTIMATE: CAPPING WITH INSTITUTIONAL CONTROLS
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA

	Task	Quantity	Unit Cost	Total Cost
1	***Alternative 2 Construction***			
1a	Geomembrane Placement	90000	$0.55 /sq ft	$49,500
1b	Vegetated Soil Cover Construction	10000	$21 /cy	$210,000
1c	Engineering and Oversight	1	$0.12 Geo/Soil Cost	$31,140
			ROUNDED SUBTOTAL	$290,000
2	***Laboratory Tests***	30	$160 /ea	$4,800
3	***Air Monitoring***	10	$500 /day	$5,000
4	***Permits***			$10,000
5	***Design (Plans and Specifications)***		4 %	$8,400
6	***CM/CQA***		3 %	$6,300
7	***Completion Report (Record Drawings)***			$20,000
8	***Contingency***		10 %	$21,000
			CONSTRUCTION TOTAL	**$330,000**
9	***Annual Maintenance Costs***			
9a	Landscape/Cover Maintenance	1	5000 /year	$5,000
9b	Reporting	1	3000 /year	$3,000
			ANNUAL MAINTENANCE TOTAL	**$8,000**

Notes

CM/CQA - Construction Management/Construction Quality Assurance

TABLE 6
ALTERNATIVE 3 COST ESTIMATE: EXCAVATION, TRANSPORTATION, AND DISPOSAL
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA

	Task	Quantity	Unit Cost	Total Cost
1	***Alternative 3 Construction***			
1a	Equipment and Supplies	1	$71,772 /ea	$71,772
1b	Labor	30	$943.93 /day	$28,318
1c	Excavated and Blended Soil Transportation and Disposal	7000	$50.90 /ton	$356,300
			ROUNDED SUBTOTAL	**$460,000**
2	***Laboratory Tests***	50	$160.00 /ea	$8,000
3	***Air Monitoring***	30	$500.00 /day	$15,000
4	***Permits***			$10,000
5	***Design (Plans and Specifications)***		4 %	$18,400
6	***CM/CQA***		3 %	$13,800
7	***Completion Report (Record Drawings)***			$20,000
8	***Contingency***		10 %	$46,000
			TOTAL	**$590,000**

Notes:
CM/CQA - Construction Management/Construction Quality Assurance

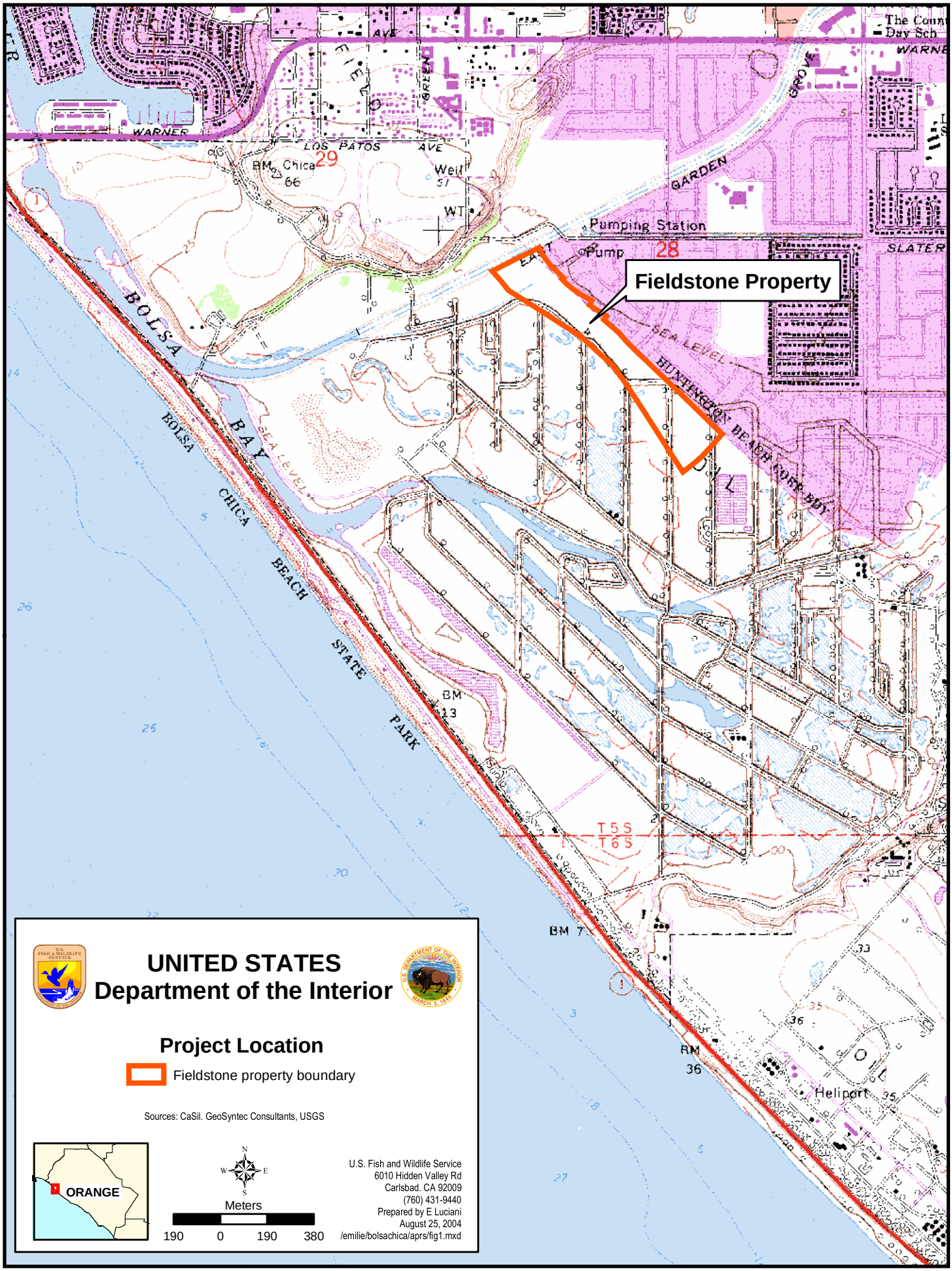
Fieldstone Property
WARNER
LOS BATOS AVE
GARDEN GROVE
SLATER
Pumping Station
Pump
BOLSA CHICA BEACH STATE PARK
BOLSA BAY
SEA LEVEL
BUNTINGDALE BEACH COVE EST
BM Chica 66
BM 13
BM 7
BM 36
T 5 S
T 6 S
Heliport
UNITED STATES
Department of the Interior
Project Location
Fieldstone property boundary
Sources: CaSil. GeoSyntec Consultants, USGS
ORANGE
N
W
E
S
Meters
190 0 190 380
U.S. Fish and Wildlife Service
6010 Hidden Valley Rd
Carlsbad. CA 92009
(760) 431-9440
Prepared by E Luciani
August 25, 2004
/emilie/bolsachica/aprs/fig1.mxd

Figure 1

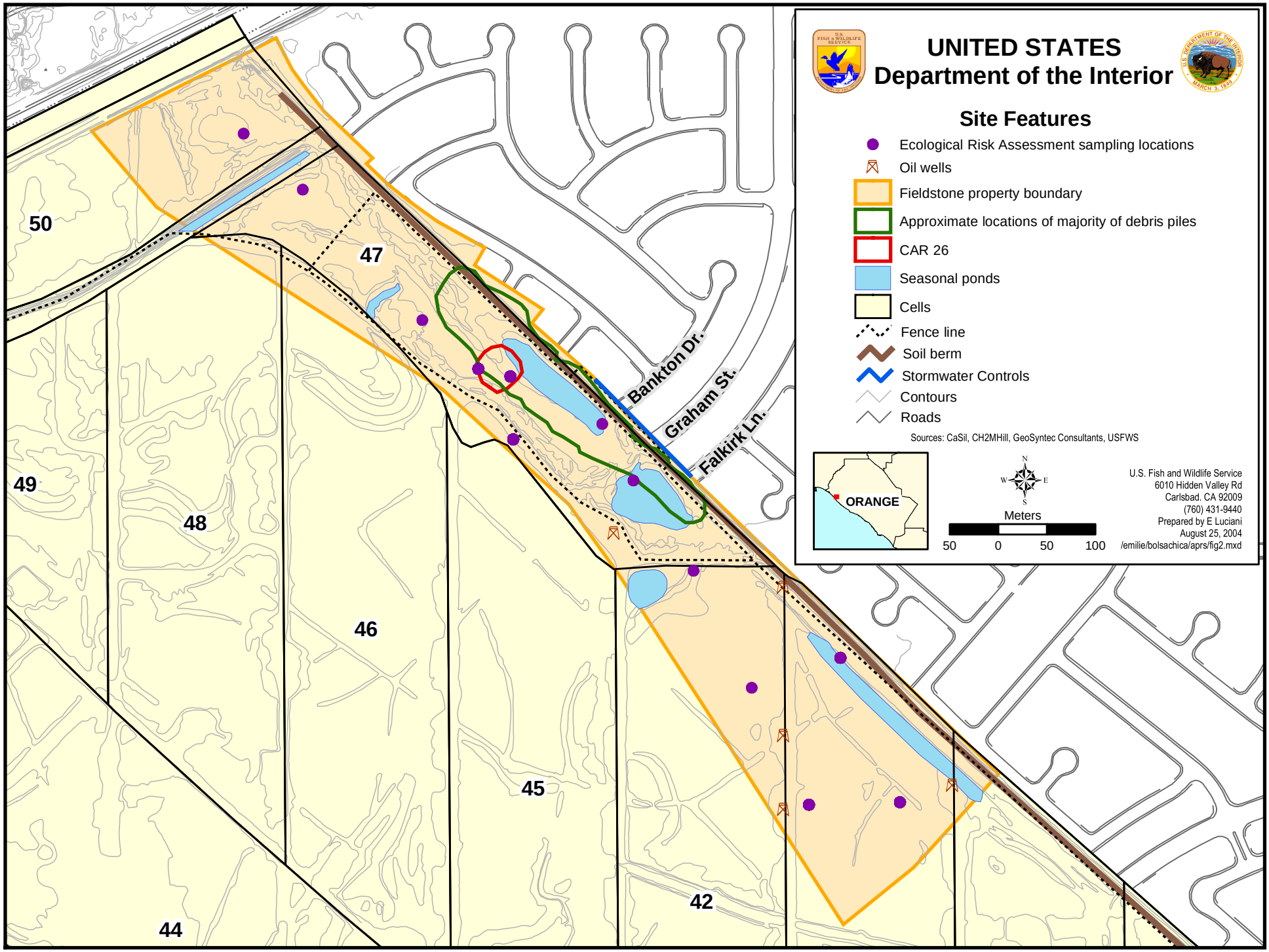
UNITED STATES
Department of the Interior
Site Features
Ecological Risk Assessment sampling locations
Oil wells
Fieldstone property boundary
Approximate locations of majority of debris piles
CAR 26
Seasonal ponds
Cells
Fence line
Soil berm
Stormwater Controls
Contours
Roads
Sources: CaSil, CH2MHill, GeoSyntec Consultants, USFWS
ORANGE
N
W
E
S
Meters
50 0 50 100
U.S. Fish and Wildlife Service
6010 Hidden Valley Rd
Carlsbad. CA 92009
(760) 431-9440
Prepared by E Luciani
August 25, 2004
/emilie/bolsachica/aprs/fig2.mxd
Bankton Dr.
Graham St.
Falkirk Ln.
50
47
49
48
46
45
42
44

Figure 2

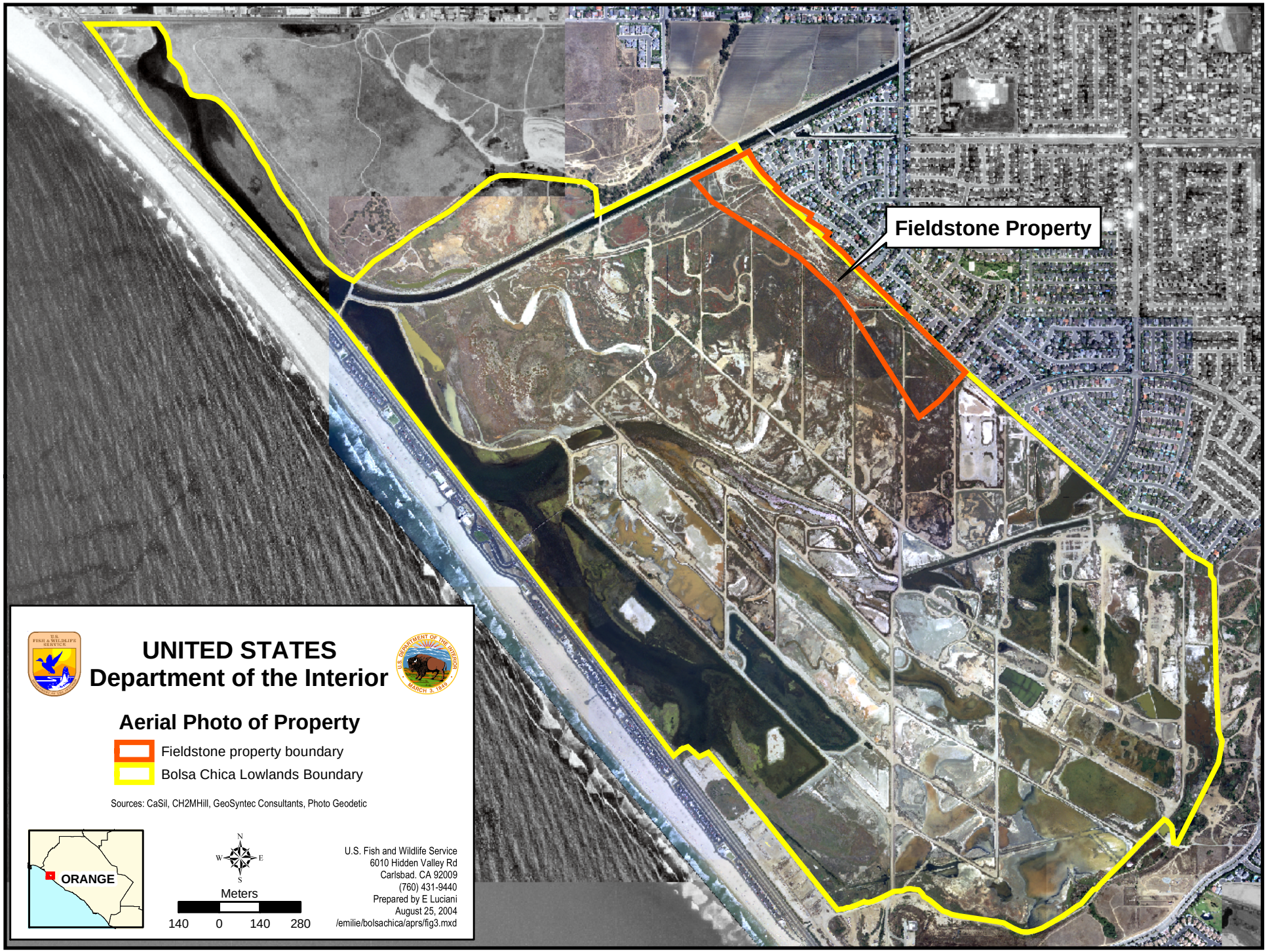
Fieldstone Property
UNITED STATES
Department of the Interior
Aerial Photo of Property
Fieldstone property boundary
Bolsa Chica Lowlands Boundary
Sources: CaSil, CH2MHill, GeoSyntec Consultants, Photo Geodetic
ORANGE
N
W
E
S
Meters
140 0 140 280
U.S. Fish and Wildlife Service
6010 Hidden Valley Rd
Carlsbad. CA 92009
(760) 431-9440
Prepared by E Luciani
August 25, 2004
/emilie/bolsachica/aprs/fig3.mxd

Figure 3

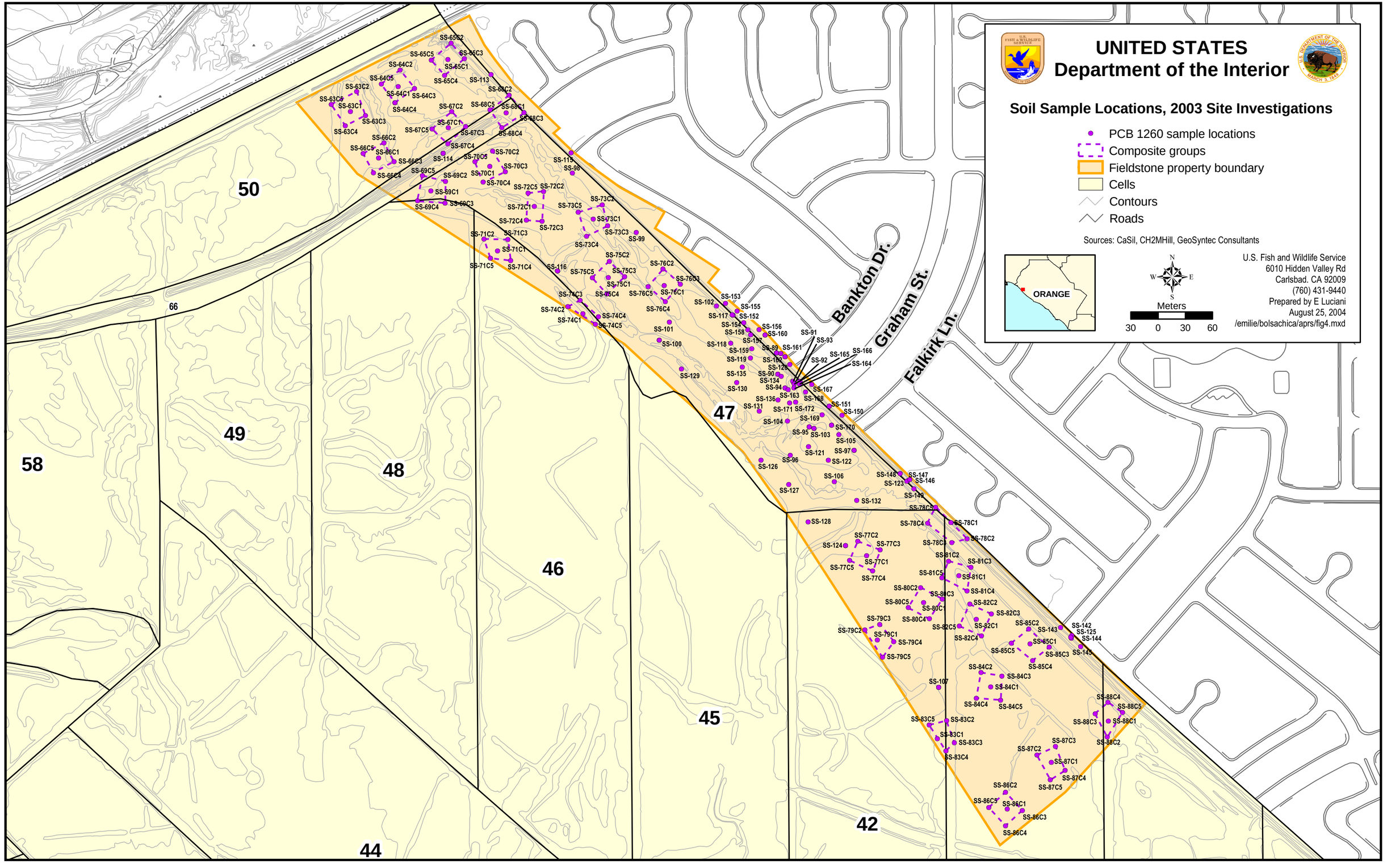
UNITED STATES
Department of the Interior
Soil Sample Locations, 2003 Site Investigations
PCB 1260 sample locations
Composite groups
Fieldstone property boundary
Cells
Contours
Roads
Sources: CaSil, CH2MHill, GeoSyntec Consultants
ORANGE
N
W
E
S
Meters
30 0 30 60
U.S. Fish and Wildlife Service
6010 Hidden Valley Rd
Carlsbad. CA 92009
(760) 431-9440
Prepared by E Luciani
August 25, 2004
/emilie/bolsachica/aprs/fig4.mxd
Bankton Dr.
Graham St.
Falkirk Ln.
50
49
58
48
66
47
46
45
44
42

Figure 4

UNITED STATES
Department of the Interior

Areas of PCB Contamination
Exceeding Cleanup Concentrations

- PCB 1260 sample locations >= 0.25 mg/kg
- PCB 1260 sample locations < 0.25 mg/kg
- Area of PCB 1260 detections >= 0.25 mg/kg from 0-1'
- Area of PCB 1260 detections >= 0.25 mg/kg from 2.5-4.5'
- Area of PCB 1260 detections >= 0.25 mg/kg from 1-2.5'
- Fieldstone property boundary
- Cells
- Roads

Sources: CaSil, CH2MHill, GeoSyntec Consultants

N
W E
S
Meters
10 0 10 20

U.S. Fish and Wildlife Service
6010 Hidden Valley Rd
Carlsbad. CA 92009
(760) 431-9440
Prepared by E Luciani
October 20, 2004
/emilie/bolsachica/aprs/fig5_upd.mxd

Bankton Dr.

Graham St.

Falkirk Ln.

3-D Rendering of Approximate Area of PCB 1260 Detections >= 0.250 mg/kg

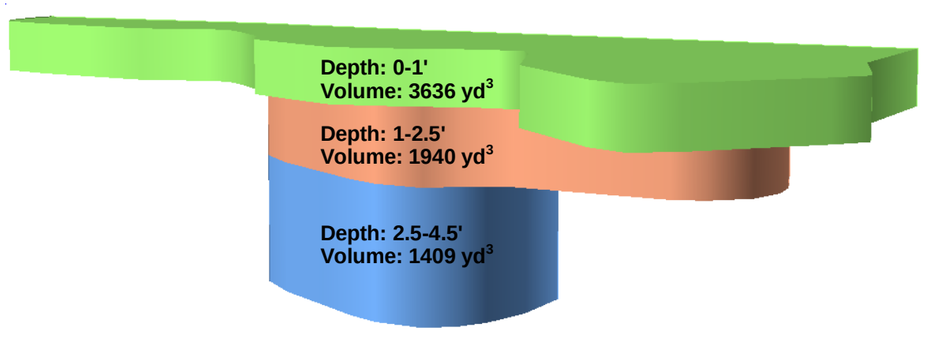

Figure 5

APPENDIX A

DTSC, SAFE SOIL PCB CONCENTRATIONS FOR THE FIELDSTONE PROPERTY

Terry Tamminen
Agency Secretary
Cal/EPA

Department of Toxic Substances Control

Edwin F. Lowry, Director
8800 Cal Center Drive
Sacramento, California 95826-3200

Arnold
Schwarzenegger
Governor

MEMORANDUM

TO: Thomas Cota
Site Mitigation
5796 Corporate Avenue
Cypress, CA 90630

FROM: Darrel Lauren, Ph.D.
Staff Toxicologist
Human and Ecological Risk Division (HERD)

DATE: 22 June 2004

SUBJECT: "Safe" Soil PCB Concentrations for the Fieldstone Property

PCA: 11050 Site: 401016

Background

The Fieldstone Property is an unincorporated area of Orange County lying between Huntington Beach and the Bolsa Chica Lowlands. Portions of the property were previously used as oil well platforms and other portions of the site were apparently used for waste soil deposition during grading and construction of adjacent home sites. In 1988, polychlorinated biphenyls (PCBs) were discovered in one of these waste soil piles. The property is proposed to be included in the Bolsa Chica Lowlands Project managed by the U.S. Fish and Wildlife Service. To this end, HERD has estimated the concentrations of PCBs (and arsenic) in soils that would cause no adverse effects to wildlife.

Introduction

In order to be consistent between regulatory agencies with the ecological risk methods used by the U.S. Fish and Wildlife Service at the Bolsa Chica Lowlands, HERD used the input parameters found in the Draft Final Ecological Risk Assessment for the Bolsa Chica Lowlands (CH2M Hill 2003) where applicable. CH2M Hill and the USWFS did not

use the BTAG toxicity reference values (TRVs) as required by HERD for screening-level ecological risk assessments. Nevertheless, HERD used the TRVs previously used for the Bolsa Chica Project to back-calculate "Safe" soil concentrations of PCBs (and arsenic) at the Fieldstone Property. A "Safe" soil concentration was defined as a hazard quotient of 1, where the dose equals the TRV.

Toxicity Reference Values

PCB analyses at the Fieldstone Property have shown that the mixture of PCB congeners is best described as Aroclor 1260. HERD selected the Aroclor 1260 toxicity reference values (TRVs) for birds and mammals from the CH2M Hill (2003) Ecological Risk Assessment for the Bolsa Chica Lowlands Project. Consistent with their approach, the LOAEL was used to estimate risk to populations of common or representative species and NOAELs were used to estimate risks to listed species.

NOAEL values were used by CH2M Hill (2003) for all receptors exposed to arsenic.

Doses

Doses to receptors were estimated using the soil-to-biota (BSAFs) for PCBs found in CH2M Hill (2003) with the addition of the Sample et al. (1999) BSAF equation for soil invertebrates. It was assumed that concentrations at the site would be entirely attributable to soil or sediment and not from water. BSAFs were not always available for Aroclor 1260. When this was the case, specific congener or total PCB BSAFs were substituted. When more than one BSAF was available, the highest BSAF was used.

Although concentrations of arsenic were measured in aquatic organisms at the site, a large literature shows that the forms of arsenic in these organisms are arsenobetaine, arsenocholine, tetramethylarsonium, and at least two arsonium sugars (Francesoni et al. (1999). These are known to be non-toxic or barely toxic to mammals at high doses and are likely to be non-toxic to birds. Therefore, when comparing doses to TRVs, a concentration value of zero was entered for aquatic prey organisms. BSAFs for mammals exposed to arsenic were found in Sample et al. (1998).

HERD used the same ingestion rates and prey composition as CH2M Hill (2003).

Area Use Factors

HERD used the area use factors (AUFs) from CH2M Hill (2003) with the addition of an AUF for California least tern derived from Atwood and Minsky (1988). HERD assumed that terns would forage for 2 miles in shallow waters up to 30 feet from shore. The site occupies 42 acres.

Results

The ecological receptor potentially most at risk from PCBs is Belding's savannah sparrow. This is for two reasons: 1) the sparrow has a larger AUF than the other

species and may receive 100% of its diet from the site, and 2) as a listed species, individual sparrows rather than a population of sparrows must be protected. In order to provide protection for Belding's savannah sparrow, the concentration of PCBs at the Fieldstone Property must be no greater than 0.25 mg Aroclor 1260/kg soil (Exhibit 1). Other birds species and the Western harvest mouse are "safe" at from 2 to 12.3 mg Aroclor 1260/kg. Because of its large forage range the coyote is "safe" a much higher concentrations.

None of the "safe" concentrations of arsenic were exceeded at the site.

Conclusions

The lowest "safe" soil concentration of Aroclor 1260 for wildlife is 0.25 mg Aroclor 1260/kg. If the debris pile shown in Figure 4-11 of the GeoSyntec January 2004 report is removed, the Fieldstone Property will present *de minimus* risk to wildlife because all residual PCBs would be removed. At this point, this property would be appropriate for transfer to the U.S. Fish and Wildlife Service for inclusion within the Bolsa Chica Lowlands Project.

Reviewed by:

Michael Anderson, Ph.D.
Staff Toxicologist, HERD

cc:

Senior Toxicologist, HERD

Exhibit 1: Safe Soil Aroclor 1260 Concentrations for Fieldstone Property

Safe [Soil][1] mg/kg	[Worm][2] mg/kg	[Mammals][3] mg/kg	[Fish][3] mg/kg	[Nereis][3] mg/kg	[Plant][3] mg/kg	Dose mg/kg BW/d	AUF[4]	TRV[5] mg/kg BW/d
203 g Black-necked Stilt								
12.3	152.53			20.50		1.8	1.0	1.8
883 g Black-crowned Night Heron								
4.6	42.89	0.16	56.44	7.67		0.3	0.14	1.8
18 g Belding's Savannah Sparrow								
0.25	1.00				0.00	0.18	1.0	0.18
116 g American Kestrel								
10.5	124.37	0.37				1.8	0.4	1.8
43.1 g Least Tern								
2			24.54			0.18	0.06	0.18

Safe [Soil][1] mg/kg	[Worm][2] mg/kg	[Mammals][3] mg/kg	[Plant][3] mg/kg	Dose mg/kg BW/d	AUF[4]	TRV[5] mg/kg BW/d
10 g Western Harvest Mouse						
12.3	152.53		0.00	6.9	1.00	6.9
23000 g Coyote						
132000		4620.00	0.00	6.9	0.01	6.9

Notes:

1) Safe [Soil] back calculated iteratively from Dose/TRV = 1.
2) [Worm] estimated by applying soil-to-biota accumulation factors (BSAFs) in Sample et al. 1999
3) Other BSAFs from Table 3-12 in Revised Final Ecological Risk Assessment for Bolsa Chica Lowlands Project. Prepared for the USFWS by CH2M Hill (Sacramento)
4) Area Use Factors (AUF) from Revised Final Ecological Risk Assessment for Bolsa Chica Lowlands Project
5) Toxicity reference values (TRVs) from Revised Final Ecological Risk Assessment for Bolsa Chica Lowlands Project CH2M Hill used LOAELs for representative species and NOAELs for listed species. Since the site contains Aroclor 1260, the TRVs selected are for Aroclor 1260

BSAFs for PCBs

	Plants	Mammals	Coryxids	Nereis	Mussel	Shrimp	Snails	Fish
Total PCB			0.17	0				12.27
Aroclor 1254			0.59	1.667				11.5
Aroclor 1260				0.714				1.67
PCB 138								1.32
PCB 153	0	0.052			0	0	0	2.06
PCB170		0.026						
PCB 180		0.027						
Mean=	0	0.035		1.1905				
Selected BSAF=	0	0.035	0.59	1.667	0	0	0	12.27

Area Use Factors

	hectares	acres	Site acres	AUF	Reference
	1	2.477			
still	10	24.77	42	1.70	CH2M Hill 2003
sparrow	3.2	7.9264	42	5.30	CH2M Hill 2003
kestrel	41	101.557	42	0.41	CH2M Hill 2003
coyote	1430	3542.11	42	0.01	CH2M Hill 2003
tern		7.27	0.41	0.06	Atwood and Minsky 1986
	meters	feet	Site feet	AUF	Reference
	1	0.305			
heron	8000	26229.5082	3600	0.14	CH2M Hill 2003

Toxicity Reference Values

Table 3-27 in CH2MHill ERA Vol. 1:

Birds		pheasant mg/kg/d	quail mg/kg/d		Reference
Aroclor	1254	1.8		LOAEL	Dalgren et al. 1972
	1260		178	LC50	Hill and Camardese 1986
			1.8	ACR=100	(Representative species)
			5.41	ACR=32.9	Lutlik and Aldenberg 1997
			0.18	NOAEL	(Listed species)

Mammals		rat mg/kg/d	rat mg/kg/d		
Aroclor	1254	0.32		NOAEL	Linder et al. 1974
	1260		6.9	NOAEL	Linder et al. 1974

Conclusions:

The threatened and/or endangered species Belding's Savannah Sparrow has the greatest potential exposure and is assumed to be more sensitive than other avian receptors.
Nevertheless, the "safe" soil concentration for Aroclor 1260 (0.25 mg/kg) is greater than the MDL (0.22 mg/kg) and the PCB concentrations at the site outside of the debris pile area.
Therefore, clean-up of the debris pile area will provide protection of all ecological receptors evaluated.

Exhibit 1: Safe Soil Arsenic Concentrations for Fieldstone Property

Safe [Soil][1] mg/kg	[Worm][2] mg/kg	[Mammals][2] mg/kg	[Fish][3] mg/kg	[Nereis][3] mg/kg	[Plant][3] mg/kg	Dose mg/kg BW/d	AUF[4]	TRV[5] mg/kg BW/d
203 g Black-necked Stilt								
378	58.92			0.00		5.14	1.0	5.14
883 g Black-crowned Night Heron								
12675	1841.69	164.02	0.00	0.00		5.14	0.14	5.14
18 g Belding's Savannah Sparrow								
38.5	6.28				9.78	5.14	1.0	5.14
116 g American Kestrel								
1198	182.48	41.93				5.14	0.4	5.14
43.1 g Least Tern								
NA				0.00		0.00	0.06	5.14

Safe [Soil][1] mg/kg	[Worm][2] mg/kg	[Mammals][2] mg/kg	[Plant][3] mg/kg	Dose mg/kg BW/d	AUF[4]	TRV[5] mg/kg BW/d
10 g Western Harvest Mouse						
84	13.49		0.25	2.5	1.00	2.5
23000 g Coyote						
55000		871.79	0.04	2.5	0.01	2.5

Notes:

1) Safe [Soil] back calculated iteratively from Dose/TRV = 1.
2) [Worm] estimated by applying soil-to-biota accumulation factors (BSAF regression equation) in Sample et al. (1999); [Mammal] estimated using BSAF regression equation from Sample et al. (1998)
3) Other BSAFs from CH2M Hill (2003)
4) Area Use Factors (AUF) from Revised Final Ecological Risk Assessment for Bolsa Chica Lowlands Project
5) Toxicity reference values (TRVs) from Revised Final Ecological Risk Assessment for Bolsa Chica Lowlands Project, prepared for the USFWS by CH2M Hill (Sacramento).

BSAFs for Arsenic

	Plants	Coryxids	Nereis	Mussel	Shrimp	Snails	Fish
Arsenic	0.254	0.573	0.033	NA	NA	NA	NA
Selected BSAF=	**0.254**	0*	0*	0*	0*	0*	0*

* Assumed to be non-toxic metabolites such as arsenobetaine

Area Use Factors

	hectares	acres	Site acres	AUF	Reference
	1	2.477			
stilt	10	24.77	42	**1.70**	CH2M Hill 2003
sparrow	3.2	7.9264	42	**5.30**	CH2M Hill 2003
kestrel	41	101.557	42	**0.41**	CH2M Hill 2003
coyote	1430	3542.11	42	**0.01**	CH2M Hill 2003
tern		7.27	0.41	**0.06**	Atwood and Minsky 1988

	meters	feet	Site feet	AUF	Reference
	1	0.305			
heron	8000	26229.5082	3600	**0.14**	CH2M Hill 2003

Toxicity Reference Values

Table 3-27 in CH2MHill ERA Vol. 1.

Birds	mallard mg/kg/d		Reference
Arsenic	**5.14**	NOAEL	Heinz et al. 1989

Mammals	rat mg/kg/d	dog mg/kg/d		
Arsenic	**2.5**	11.6*	NOAEL	Byron et al. 1967

*The adverse effects on dogs (i.e., coyote) are due to food avoidance and starvation.

Conclusions:

The Western Harvest Mouse has the greatest potential exposure and highest hazard quotient.
The "safe" soil concentration for Arsenic (84 mg As/kg) is greater than the Arsenic concentrations at the site.
Therefore, no clean-up of Arsenic is required.

APPENDIX B

HEALTH AND SAFETY GUIDELINES

HEALTH AND SAFETY GUIDELINES FOR THE REMOVAL ACTION WORKPLAN FIELDSTONE PROPERTY ORANGE COUNTY, CALIFORNIA DOCKET NO.: HAS-CO 01/02-154 CONSENT ORDER RESPONDENT: HEARTHSIDE RESIDENTIAL CORP.

SUBMITTED TO:

STATE OF CALIFORNIA

Department of Toxic Substances Control

PREPARED BY:

GeoSyntec Consultants

GeoSyntec Consultants
2100 Main Street, Suite 150
Huntington Beach, California 92648
(714) 969-0800 ● Fax (714) 969-0820
www.geosyntec.com

15 October 2004

HEALTH AND SAFETY GUIDELINES
FOR THE REMOVAL ACTION WORKPLAN
FIELDSTONE PROPERTY

TABLE OF CONTENTS

Page

B.1. OVERVIEW

B.1.1 Terms of Reference

These health and safety guidelines pertain to the Removal Action (RA) that is planned for the Fieldstone Property (the Site) in Orange County, California. The RA includes removal of Site soil for off-Site disposal. The plan for implementing the RA is described in the Removal Action Workplan (RAW). The RAW was prepared by the staff of the United States Fish and Wildlife Service and the Department of Toxic Substances Control (DTSC) in accordance with Section 25323.1 of the California Health and Safety Code Health.

In addition to consulting the guidelines provided in this document, all parties that will be conducting field activities during the RA should evaluate potential site-specific health and safety concerns. Each of these parties should review the RAW and develop their own health and safety procedures, plans, and policies, in accordance with state and federal requirements. Health and Safety Plans (HASPs) that are developed by the parties should be site-specific and address RA implementation activities.

B.1.2 Health and Safety Plans

Site-specific HASPs are required of each party that will be conducting field activities during the RA. The HASPs should comply with applicable state and federal regulations. Additionally, in their Consent Order HAS-CO 01/02-154, the DTSC requires that the Site HASPs describe the following:

1. Field activities including work tasks, objectives, and personnel requirements and a description of hazardous substances on the Site;

2. Respondent's key personnel and responsibilities;

3. Potential hazards to workers including chemical hazards, physical hazards, confined spaces and climatic conditions;

4. Potential risks arising from the work being performed including the impact to workers, the community and the environment;

5. Exposure monitoring plan;

6. Personal protective equipment and engineering controls;

7. Site controls including work zones and security measures;

8. Decontamination procedures;

9. General safe work practices;

10. Sanitation facilities;

11. Standard operating procedures;

12. Emergency response plan covering workers addressing potential hazardous material releases;

13. Training requirements;

14. Medical surveillance program; and

15. Record keeping.

B.1.3 General Safe Work Practices

Attachment A contains a list of general safe work practices. The list shown in Appendix A should be expanded upon by each party that is conducting fieldwork during the RA. Additionally, health and safety inspections should be conducted regularly, and the inspection process should be detailed in each party's Site-specific HASP. Checklists (example included in Attachment B) should be used during inspections that are conducted by each party. If needed, the checklists should be augmented in the field to add new inspection points.

B.1.4 Chemical Communication

Table 1 summarizes polychlorinated biphenyl Aroclor 1260 (PCB) results for soil samples collected at the Site. Other chemicals were detected in the soil samples.

Those results can be found in the Remedial Investigation Report[1]. The chemicals detected at the Site should be discussed in the site-specific HASPs. The primary chemical that was detected in Site soil samples is PCB. Table 2 contains a summary some of the properties of PCB. Additionally, Attachment C contains a Material Safety Data Sheet (MSDS) for PCB. The presence of PCB and its associated risks should be addressed in the each party's HASP and communicated to workers.

In their HASPs, parties should also include other chemicals that could potentially be encountered by workers at the Site. These may include gasoline, hydraulic fluid, and other substances that may be used during the RA.

B.1.5 Hazard Communication and Mitigation

Site hazards should be evaluated by each party prior to RA implementation. Their HASPs should contain procedures for mitigating the hazards that are selected as potential hazards during the RA. Attachment D contains a partial index of potential hazards, along with general guidelines for their mitigation. None of the hazard mitigation procedures should be relied upon solely. Each party should conduct their own audit of the potential Site hazards and develop their own procedures for hazard mitigation.

[1] GeoSyntec Consultants, 2004. Remedial Investigation Report, Fieldstone Property, Orange County, California, Consent Order HAS-CO 01/02-154, 18 June 2004.

B.2. SUMMARY

The information contained in this document is for general guidance purposes only. Health and safety of Site personnel is the responsibility not only of the individual, but also of the company or agency that they report. Contaminants do exist at the Site, specifically PCB. Physical hazards are also involved in the RA work planned for thise Site. In accordance with state and federal law, it is the responsibility of each company or agency involved in the implementation of the RA to prepare site-specific HASPs addressing the chemical and physical hazards of this Site work.

TABLES

TABLE 1
SOIL CHEMICAL DETECTION SUMMARY
POLYCHLORINATED BIPHENYL (PCB)
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA

Depth Interval (ft bgs)	Number of Samples	Number of Samples > 0.25 mg/kg	Number of Samples > 50 mg/kg
0 - 0.5	205	24	6
0.5 - 1	123	90	15
1 - 1.5	7	1	0
1.5 - 2	30	11	2
2 - 2.5	178	4	0
3 - 3.5	1	0	0
3.5 - 4	4	0	0
4 - 4.5	159	4	0
6 - 6.5	163	0	0

NOTES

Chemical results for samples collected at the Site are presented in the Remedial Investigation Report, Fieldstone Property, Orange County, California, Consent Order HAS-CO 01/02-154, 18 June 2004, prepared by GeoSyntec Consultants.

ft bgs - feet below ground surface
mg/kg - milligrams per

TABLE 2: CONTAMINANT FACT SHEET – POLYCHLORINATED BIPHENYLS

CAS Number:11096-82-5	**Molecular Weight: 372.0**	**Color: Colorless to Pale Yellow**	**Ionization Potential (eV): NA**	**Vapor Density (Air=1):NA**
Synonyms: Chlorodiphenyl (54%); PCB	**Physical State: Liquid or Solid**	**Odor: Mild hydrocarbon**	**Henry's Constant: NA**	**Vapor Pressure: 0.00004 (mmHg@20C)**

Fire Hazard	**Reactivity Hazard**		**Health Hazard**
NFPA rating: 1 **HMIS rating: 1**		**NFPA rating: 0** **HMIS rating: 0**	**NFPA rating: 2** **HMIS rating: 2**
Flash Point(°F): NA LEL(%): NA UEL(%): NA	Incompatibilities: Strong oxidizers	Odor Threshold (mg/m3): NA IDLH (mg/m3): 5	Carcinogenic: OSHA: ☐ Yes ☒ Not listed
Fire Extinguishing Media: ☒ Dry Chemical ☒ Foam ☐ Water Spray ☒ CO2		Source / TWA mg/m³ / STEL mg/m³ / C mg/m³ OSHA PELs 0.5 N/A N/A ACGIH TLVs 0.5 NA NA	IARC: ☐ Group 1 ☒ Group 2A ☐ Group 2B ☐ Group 3 ☐ Group 4 ☐ Not listed
Fire Extinguisher: ☐ Class A ☐ Class B ☐ Class C ☐ Class D ☒ Class A/B/C			NTP: ☐ Known ☒ Anticipated ☐ Process ☐ Not listed
			ACGIH: ☐ A1 ☐ A2 ☒ A3 ☐ A4 ☐ A5 ☐ Not listed
		Signs/Symptoms of Acute Exposure: Irritation of eyes; chloracne	Skin Absorbable: ☒ Yes ☐ No Skin Corrosive: ☐ Yes ☒ No
DOT: ☐ Flammable Liquid ☐ Combustible Liquid	DOT: ☐ Oxidizer ☐ Water Reactive	DOT: ☐ Poison	DOT: ☐ Corrosive

Air Monitoring

Type	**EXAMPLE Brand/Model No.**	**Calibration Method/Media**
☐ Explosimeter		
☐ PID		
☐ FID		
☐ Colorometric Tubes		
☐ Chemical Monitor ☒ Dust Monitor	MIE Personal Data Ram / TSI Dustrak	Factory calibrated
☒ Collection Medium/Sampling Pump	Gilian Pump/NIOSH#5503	Calibrate pump w/ media

Protective Clothing

Glove Type/Brand (Breakthrough >2 hrs unless noted):	☐ Viton/North	☐ Viton/Best	☐ Silvershield/North	☐ 4H/Safety
	☐ Neoprene/Mapa	☐ Neoprene/Ans.Ed.	☐ Neoprene/BestUltraflex	☐ Neoprene/BestNeo.(30min)
	☐ PVC/Ans.Ed.	☐ PVC/BestHustler	☐ Nitrile/LabSafe.	☐ Nitrile/Ans.Ed.
	☐ Butyl/North	☐ PVA/Ans.Ed.	☐ Other	

If airborne dust persists > 20 min. > 1 mg/m3 suit type indicated will be worn

Suit Type (Breakthrough >1hr unless noted): ☐ Tyvek ☐ Tyvek QC(20min) ☐ Tyvek/Saranex ☐ Tychem7500 ☐ Tychem 9400 ☐ Tychem 10,000 ☐ Other

Respiratory Protection

☒ Air Purifying ☐ Air Supplied Only	Maximum Use Concentration (ppm): Half mask: OV/HEPA Full face: OV/HEPA
Notes:	
Prepared by: Sherry Hall	Date: 16 January 1997, Rev. 31 January 2002

ATTACHMENTS

ATTACHMENT A
PARTIAL LIST OF POTENTIAL GENERAL SAFE WORK PRACTICES

- Minimize contact with excavated or contaminated materials. Do not place equipment on the ground. Do not sit or kneel on potentially contaminated surfaces.
- Smoking, eating, or drinking after entering the work zone and before decontamination must not be allowed. Use of illegal drugs and alcohol are prohibited. Workers taking prescribed medication that may cause drowsiness should not be operating heavy equipment, and should be prohibited from performing tasks where Level C, B, or A personal protective equipment is required.
- Practice good housekeeping. Keep everything orderly and out of potentially harmful situations.
- Communication devices should be tested daily to ensure their working condition.
- Use of contact lenses on-site should be evaluated when working near contaminants.
- The following conditions must be observed when operating a motor vehicle.
  - Wearing of seat belts is mandatory
  - During periods of rain, fog, or other adverse weather conditions, the use of headlights is mandatory
  - A backup warning system or use of vehicle horn is mandatory when the vehicle is engaged in a backward motion
  - All posted traffic signs and directions from flagmen must be observed
  - Equipment and/or samples transported in vehicles must be secured from movement
- In an unknown situation, always assume the worst conditions.
- Be observant of your immediate surroundings and the surroundings of others. It is a team effort to notice and warn of impending dangerous situations. Withdrawal from a hazardous situation to reassess procedures is the preferred course of action.
- Conflicting situations may arise concerning safety requirements and working conditions and must be addressed and resolved rapidly by the Health & Safety Officer and Project Manager to relieve any motivations or pressures to circumvent established safety policies.
- Unauthorized breaches of specified safety protocol must not be allowed. Workers unwilling or unable to comply with the established procedures must be discharged.

ATTACHMENT B
EXAMPLE WEEKLY HEALTH AND SAFETY INSPECTION CHECKLIST

Project: _____ Date: _____

Inspected by: _____

Category	Observations / Corrective Actions
Pre-entry briefing records are current	
Tailgate meeting records are current	
Training/medical surveillance/respiratory protection records are current	
Site map is posted	
Buddy system is implemented	
Work zones are identified	
Site access is controlled	
Visitors are being escorted	
On-site/off-site communications are in working order	
Safe work practices are being implemented	
Any additional hazards incurred?	
Air monitoring equipment is in working condition	
Air monitoring records are being recorded in field logbook	
Air monitoring calibration records are being recorded in field logbook	
PPE storage area is neat and organized	
Standard operating procedures are being implemented	
Housekeeping at decontamination zone is appropriate	
Decontamination procedures are being implemented	
Emergency response equipment is in working condition	
Route to hospital is posted	
Confined space entry program is being implemented	
Spill containment equipment is available	
Chemical inventory is up to date	
Material safety data sheets are available	
Primary and secondary containers are properly labeled	
Housekeeping at the chemical storage area is appropriate	
Identify and evaluate all other inspection points as described in the HASP	

ATTACHMENT C
MATERIAL SAFETY DATA SHEETS

ATTACHMENT D
EXAMPLE HAZARD ANALYSIS

TASKS	
①	⑤
②	⑥
③	⑦
④	⑧

	①	②	③	④	⑤	⑥	⑦	⑧
I. Chemical Hazards								
Fire								
Inhalation								
Reactivity								
Skin absorption								
II. Physical Hazards								
Cold Stress								
Compressed Gas Cylinder								
Drilling								
Drowning								
Drum Handling								
Electrocution								
Excavation/Trenching								
Eye Injury								
Hand/Foot Injury								
Heat Stress								
Heavy Equipment								
Lifting Heavy Loads								
Noise								
Portable Power/Hand Tool								
Radiation Exposure								
Slipping/Tripping/Falling								
Other:								
III. Biological Hazards								
Allergic Reaction to Poisonous Plants								
Insect/Vermin/Snake Bites								
Medical Waste								
Other								

HAZARD MITIGATORS –
INHALATION (Organic Vapor/Dust)

Applies to Task: ☐① ☐② ☐③ ☐④ ☐⑤ ☐⑥ ☐⑦ ☐⑧

- Be aware that the lungs are extremely vulnerable to chemical agents. Even substances that do not directly affect the lungs may pass through lung tissue into the bloodstream, where they are transported to other vulnerable areas of the body.
- Know the odor and odor threshold of the chemicals of concern. Some toxic chemicals present in the atmosphere may not be detected by human senses (i.e., they may be odorless and colorless, and their toxic effects may not produce any immediate symptoms).
- Use engineering controls to reduce vapor concentrations (e.g., ventilation) or dusty atmospheres (e.g., dust suppression techniques).
- Wear respiratory protection as indicated by air monitoring results and/or as required by the Health and Safety Plan.
- Implement any other procedure that applies.

HAZARD MITIGATORS – SKIN ABSORPTION

Applies to Task: ☐① ☐② ☐③ ☐④ ☐⑤ ☐⑥ ☐⑦ ☐⑧

- Be aware of chemicals of concern that can directly injure the skin or that can be absorbed into the bloodstream and subsequently transported to other organs.
- Know that skin absorption is enhanced by abrasions, cuts, heat, and moisture.
- Do not wear contact lenses in contaminated atmospheres (since they may trap chemicals against the eye surface). The eye is particularly vulnerable because airborne chemicals can dissolve in its moist surface and be carried to the rest of the body through the bloodstream (capillaries are very close to the surface of the eye).
- Keep hands away from face.
- Minimize contact with liquid and solid chemicals.
- Wear protective clothing (e.g., suits and gloves) as required by the Health and Safety Plan.
- Implement any other procedure that applies.

HAZARD MITIGATORS – DRUM HANDLING

Applies to Task: ☐① ☐② ☐③ ☐④ ☐⑤ ☐⑥ ☐⑦ ☐⑧

- Use only drums and containers that meet the appropriate DOT, OSHA, and EPA regulations.
- Be aware of the potential hazards of the contents of drums or containers before handling.
- Inspect the integrity of the drum or container before moving. Any drum or container lacking integrity shall be overpacked.
- Consider any unlabeled drum or container as containing a hazardous substance and leave alone until contents are properly identified and labeled.
- Organize site operations to minimize the amount of drum or container movement.
- Never stand on drums or containers.
- Know that bulging drums or containers are an indication of pressure build-up. Pressure can be relieved slowly by carefully loosening the bung. If the possibility of fire or explosion exists, protective shield should be used, and/or remote opening devices.
- Utilize drum/container handling equipment whenever possible. The equipment utilized should have a sufficiently rated load capacity, and should be able to operate smoothly on the available surface.
- Use proper lifting and moving techniques to prevent back injuries, if handling equipment is not available.
- Have a clear view of the available pathway when moving drums. If needed, an additional person should be available to provide guidance.
- Set up drum/container staging areas to safely identify and classify contents for proper shipment. Staging areas shall be provided with adequate ingress and egress routes.
- Label and identify drums and containers as to their contents when moved to the staging areas.
- Cease all site operations immediately if site activities uncover buried drums or containers. The SHSO must be notified. The SHSO will evacuate the site. All unknown situations must be evaluated before site activities are resumed. The services of a specialized contractor trained in handling unknown contaminants may be needed. If, after evaluating the situation, only a portion of the site is effected, that area shall be barricaded and work may continue at other portions of the site.
- Implement any other procedure that applies.

HAZARD MITIGATORS –
EYE INJURY

Applies to Task: ☐① ☐② ☐③ ☐④ ☐⑤ ☐⑥ ☐⑦ ☐⑧

- Wear appropriate eye protection according to the task at hand (e.g., goggles if liquid splash could occur, welding lenses, etc.).
- Minimize the amount of vapor or particulate matter generated, if possible.
- Avoid touching the face and eyes.
- Flush eye with water for at least 15 minutes if chemicals do get into the eye. Then get medical attention as soon as possible.
- Implement any other procedure that applies.

HAZARD MITIGATORS –
HAND / FOOT INJURY

Applies to Task: ☐① ☐② ☐③ ☐④ ☐⑤ ☐⑥ ☐⑦ ☐⑧

- Be aware of "pinch points" when working with tools and heavy equipment.
- Use proper lifting techniques to avoid dropping heavy loads on hands and feet.
- Be aware of moving machinery and heavy equipment in the work area.
- Wear protective gloves as required in the Health and Safety Plan.
- Wear steel-toed boots as required in the Health and Safety Plan.
- Implement any other procedure that applies.

HAZARD MITIGATORS – HEAT STRESS

Applies to Task: ☐① ☐② ☐③ ☐④ ☐⑤ ☐⑥ ☐⑦ ☐⑧

- Be able to recognize and treat heat stress, and to identify the signs and symptoms of heat stress (e.g., muscle spasms, dizziness, lack of perspiration).
- Maintain an optimal level of physical fitness. Fit individuals may acclimatize more readily to temperatures.
- Adjust work and rest schedules as needed. Establish a work regimen that will provide adequate rest periods for cooling down. This may require additional shifts of workers.
- Provide shelter or shaded areas (77 F is best) to protect personnel during rest periods.
- Maintain worker's body fluids at normal levels to ensure that the cardiovascular system functions adequately. Daily fluid intake must equal the approximate amount of water lost in sweat. Workers are encouraged to drink more than the amount required to satisfy thirst, because thirst is not an adequate indicator of adequate salt and fluid replacement.
- Remove impermeable protective garments during rest periods.
- Do not assign other tasks to personnel during rest periods.
- Provide cooling devices, when necessary, to aid natural body heat exchange during prolonged work or severe heat exposure. Effect devices include field showers or hose-down areas; as well as cooling jackets, vests, or suits.
- Implement any other procedure that applies.

HAZARD MITIGATORS – HEAVY EQUIPMENT

Applies to Task: ☐① ☐② ☐③ ☐④ ☐⑤ ☐⑥ ☐⑦ ☐⑧

- Apply Hazard Mitigators for motor vehicles when utilizing heavy equipment (where applicable).
- Remember, heavy equipment has the right-of-way over regular vehicles and pedestrians. Yield to heavy equipment.
- Listen for warning signals on heavy equipment.
- Perform a visual inspection and walk around parked heavy equipment before moving to assure that equipment is in good condition and that there are no personnel on the ground that could be injured or objects that could be damaged by vehicle movement.
- Use hand rails and footholds when mounting and dismounting equipment,
- Follow appropriate equipment startup procedures. Brakes, steering, clutches and controls shall be tested.
- Pay attention to workers on the ground who may be in the path and provide warning prior to moving the equipment.
- Permit no one to ride on, or in, heavy equipment. This includes any portion of a backhoe, bulldozer, forklift or the back of a pickup truck, except in locations specifically designed for passenger use and approved by the SHSO.
- Locate and flag underground utilities and buried cables, whenever possible, prior to intrusive activities (such as excavation and drilling).
- Keep haulage vehicles under positive control at all times while operating. Vehicles shall be kept in gear when descending grades.
- Do not use heavy equipment on slopes with steepness exceeding 3H:1V unless operations are consistent with manufacturer's recommendations (if the Owner's Manual is not with the equipment or does not specify slope operating procedures, see the SHSO).
- Operate equipment with booms, blades, buckets, beds, etc., lowered or in a stable position while on slopes. Safety cables tethered to appropriate anchors shall be used for equipment working on steep slopes, where appropriate. The use of cables and anchors must be approved by the SHSO.
- Use rollover protection and seat belts.
- Lower hydraulic systems (e.g., blades, rippers, etc.) to the ground, set brakes, and shut down equipment if malfunction occurs which impairs the ability to control a piece of equipment.
- Suspend in slings or support by hoists or jacks heavy equipment in need of repair. The equipment must also be blocked or cribbed before workers are permitted to work underneath. Working under heavy equipment can pose a crushing hazard.

HAZARD MITIGATORS – HEAVY EQUIPMENT

Applies to Task: ☐① ☐② ☐③ ☐④ ☐⑤ ☐⑥ ☐⑦ ☐⑧

- Shut off motors, do not allow smoking, and use proper dispensing equipment when refueling gasoline-operated equipment to prevent fire hazards.
- Wear hearing protection if required.
- Maintain eye contact with the heavy equipment operator when working near equipment.
- Be aware of changes in sound of equipment which may indicate a change in direction or activity.
- Implement any other procedure that applies.

HAZARD MITIGATORS – LIFTING HEAVY LOADS

Applies to Task: ☐① ☐② ☐③ ☐④ ☐⑤ ☐⑥ ☐⑦ ☐⑧

- Know and practice proper lifting techniques.
- Limit continuous lifting of weights to 50 pounds or less. Lifts of heavier weights are permitted on an interim basis. Help shall be obtained for lifting of loads greater than 50 pounds. Mechanical equipment should be used on heavy materials when possible. If mechanical assistance is not available, adequate manpower to maintain the 50-pound limit per employee will be required.
- Do not lift more weight than can be handled comfortably, regardless of load weight. If necessary, help should be requested to lift a load so that the lifting is comfortable.
- Use drum dollies when moving drums or barrels.
- Inspect objects for grease or slippery substances before they are lifted to ensure that the object will not slip.
- Do not carry long, bulky or heavy objects without first verifying that the way is clear and that vision is unobstructed. This ensures that other persons or objects will not be struck by the load.
- Do not carry loads that cannot be seen over or around.
- Make sure workers are physically suited for the job before assigning jobs requiring heavy and/or frequent lifting. A person's lifting ability is not necessarily indicated by his height or weight.
- Before lifting an object, consideration should be given to how the object will be set down without pinching or crushing hands or fingers. For example, to place an object on a bench or table, the object should be set on the edge and pushed far enough onto the support so it will not fall. The object can then be released gradually as it is set down, and pushed in place with the hands and body from in front of the object.
- When two or more persons are handling the same object, one should "call the signals". All the persons on the lift should know who this person is and should warn him if anyone in the crew is about to relax his grip.
- Proper lifting includes:
  - *Feet* - Feet should be parted, with one foot alongside the object being lifted and one behind. Feet should be comfortably spread to give greater stability. The rear foot should be in position for the upward thrust of the lift.

HAZARD MITIGATORS – LIFTING HEAVY LOADS

Applies to Task: ☐① ☐② ☐③ ☐④ ☐⑤ ☐⑥ ☐⑦ ☐⑧

- *Back* - Use the sit-down position and keep the back straight, but remember that "straight" does not mean "vertical". A straight back keeps the spine, back muscles, and organs of the body in correct alignment. It minimizes the compression of the abdomen that can cause a hernia.
- *Arms and Elbows* - The load should be drawn close, and the arms and elbows should be tucked into the side of the body. When the arms are held away from the body, they lose much of their strength and power. Keeping the arms tucked in also helps keep body weight centered.
- *Palm* - The palm grip is one of the most important elements of lifting. The fingers and the hand are extended around the object to be lifted. Use the full palm; fingers alone have very little power.
- *Chin* - Tuck in the chin so the neck and head continue the straight back line. Keep the spine straight and firm.
- *Body Weight* - Position the body so its weight is centered over the feet. This provides a more powerful line of thrust and assures better balance. Start the lift with a thrust of the rear foot. Shift hand position so the object can be boosted after knees are bent. Straighten knees as object is lifted or shifted to the shoulders. To change direction, lift the object to a carrying position, and turn the entire body, including the feet. Do not twist your body. In repetitive work, both the person and the material should be positioned so that the worker will not have to twist his body when moving the material. If the object is too heavy to be handled by one person, get help.

- Implement any other procedure that applies.

HAZARD MITIGATORS –
SLIPPING / TRIPPING / FALLING

Applies to Task: ☐① ☐② ☐③ ☐④ ☐⑤ ☐⑥ ☐⑦ ☐⑧

- Wear the proper footwear for the task at hand.
- Pay attention to the environment and use caution when moving about on site.
- Follow the easiest and safest path to the destination.
- Follow good housekeeping procedures.
- Remove objects that pose tripping hazards where practicable.
- Prevent water accumulation where practicable.
- Implement any other procedure that applies.

HAZARD MITIGATORS –
INSECT / VERMIN / SNAKE BITES

Applies to Task: ☐① ☐② ☐③ ☐④ ☐⑤ ☐⑥ ☐⑦ ☐⑧

- Be able to recognize insects/vermin/snakes indigenous to the site location.
- Advise the Health & Safety Officer if you have allergies to any insects prior to engaging in any field activities.
- Include the following controls:
  - Boots, hoods, netting, gloves, masks, or other personal protection.
  - Repellents.
  - Drainage or spraying of breeding areas.
  - Burning or destruction of nests.
  - Smudge pots and aerosols for protecting small areas.
  - Elimination of unsanitary conditions which propagate insects or vermin.
  - Extermination measures.
  - Inoculation.
- Report any bites or stings to the Health & Safety Officer and seek first aid immediately.
- Implement any other procedure that applies.

APPENDIX C

SOIL SAMPLING PLAN

SOIL SAMPLING PLAN
FOR THE REMOVAL ACTION WORKPLAN
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA
DOCKET NO.: HSA-CO 01/02-154
CONSENT ORDER RESPONDENT:
HEARTHSIDE RESIDENTIAL CORP.

SUBMITTED TO:

STATE OF CALIFORNIA

Department of Toxic Substances Control

PREPARED BY:

GeoSyntec Consultants

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15 October 2004

FIELDSTONE PROPERTY
SOIL SAMPLING PLAN FOR THE
REMOVAL ACTION WORKPLAN

TABLE OF CONTENTS

Page

FIGURE

1. INTRODUCTION

1.1 Terms of Reference

This Soil Sampling Plan (SSP) was prepared by GeoSyntec Consultants (GeoSyntec) for the Removal Action (RA) at the Fieldstone Property (the Site) in Orange County, California. This SSP is a component of the Removal Action Workplan (RAW), which was prepared by the staff of the United States Fish and Wildlife Service and the Department of Toxic Substances Control in accordance with Section 25323.1 of the California Health and Safety Code. This SSP addresses soil sampling subsequent to RA soil excavation activities. This SSP also provides quality control procedures for sampling and analysis. Further descriptions of quality control procedures are included in the Quality Assurance Project Plan, which is also a component of the RAW.

1.2 Project Background

The Fieldstone Property is an approximately 42-acre parcel located in an unincorporated area of Orange County adjacent to Huntington Beach, California. During the performance of an environmental assessment of adjacent property, known as the Bolsa Chica Lowland, samples were also collected from the Site for analysis. Polychlorinated biphenyls (PCB) were detected in Site soil samples.

Following the notification of the appropriate agencies, the Site owner, Hearthside Residential Corp. (Hearthside), entered into a Consent Order with the Department of Toxic Substances Control (DTSC). Hearthside conducted an extensive Remedial Investigation (RI) of the Site, as required by the Consent Order. Based on historical and RI data, the DTSC is implementing a non-emergency RA to excavate and remove the approximately 2-acre area of the Site soil where samples with PCB concentrations in excess of the cleanup level, 0.25 mg/kg as PCB Aroclor 1260, have been collected. The Removal Action Workplan (RAW), prepared by DTSC and the U.S. Fish and Wildlife Service (USFWS), concluded that “excavation and off-site disposal” is the most appropriate removal action for the Site.

1.3 Soil Sampling Objective

Additional sampling of Site soil will be conducted as part of the RA. This soil sampling will be performed to evaluate whether residual PCB concentrations exceeding the cleanup level of 0.25 mg/kg remain in the underlying soil following excavation.

1.4 Removal Action Workplan and Soil Sampling Plan Objectives

Refer to the RAW for a description of the RA objectives. The objective of this SSP is to describe procedures for soil sampling. The soil sampling procedures are intended to yield data that are suitable for use in evaluating the PCB concentration, if any, in residual soils as the RA progresses.

1.5 Soil Sampling Plan Organization

The remainder of this SSP includes the following sections:

- Section 2, *Soil Sampling Procedures*, outlines the procedures for collecting the soil samples;
- Section 3, *Sample Handling*, outlines the procedures for preparing the soil samples in preparation for shipment to the analytical laboratory;
- Section 4, *Soil Sample Analysis*, provides the analytical methods that will be used to analyze the soil samples; and
- Section 5, *Sampling Waste Management Plan*, describes how the investigation-derived waste (IDW) will be disposed.

2. SOIL SAMPLING PROCEDURES

2.1 General

Soil samples will be collected from the excavation area to evaluate the soil for residual PCB concentrations in soils expected to remain on site in excess of the cleanup level. This section describes how the sample locations will be selected and named, and how the samples will be collected and cross-contamination avoided.

2.2 Sample Locations

Post-excavation soil sampling will be performed within the limits of the RA excavation. The excavated area will be visually divided into a grid of areas approximately 50-feet (ft) by 50-ft. The grid areas will be subdivided visually into four smaller 25-ft by 25-ft sub-grids. A sample will be collected from the approximate center of each sub-grid. Figure 2-1 shows a map of the approximate grid areas, sub-grids, and soil sample locations. The four sub-grid samples collected per 50-ft by 50-ft grid area will be composited in equal volume portions and homogenized. The compositing and homogenization procedures will be performed by the analytical laboratory. Discrete samples, in addition to the composite samples, will also be collected from the approximately 0.2-acre area where the highest PCB concentrations have been detected. Sub-grid sample locations will be marked at the time of sampling and coordinates will be documented relative to the existing site survey. One sub-grid duplicate sample will be collected per 20 sub-grid samples and analyzed for PCB. Additionally, the analytical laboratory will be instructed to duplicate the compositing, homogenization, and analysis procedures for two to three grid area composite samples.

If the laboratory result from a 50-ft by 50-ft grid area composite sample or discrete sample has a reported PCB concentration equal to or less than 0.25 mg/kg, no further sampling or excavation will be conducted in that area. If the laboratory result shows a PCB concentration greater than 0.25 mg/kg, an additional layer of soil (3 inches or greater) will be removed from the floor of the 50-ft by 50-ft grid and the post-excavation sampling procedure described previously will be repeated.

The soil that is excavated will also be sampled and analyzed for PCB. Composite samples will be collected from the soil is excavated in preparation to be hauled off-Site for disposal. The results from these samples will be used to profile the excavated soil for disposal purposes.

2.3 Sample Designations

Each 50-ft by 50-ft grid area (as described in section 2.2) will be assigned a letter, beginning with 'A' in the northwestern portion of the site. Figure 2-1 illustrates how the sample locations will be named. The letter assignments progress alphabetically from northwest to southwest. The area immediately following the 'Z' area will be designated AA, and the progression will begin again. Within the 50 ft x 50 ft grid area, the four sub-grids will have a numerical designation beginning with '1' in the northern sub-grid sample, progressing clockwise to '4.' Each sample from a sub-grid will be designated with a prefix that indicates the excavation iteration number. For example, the first sample taken following excavation from the northwestern sub-grid of grid A will be designated A1-1. If PCB levels are detected above 0.25 mg/kg (the prescribed cleanup level), more soil will be excavated from grid area 'A' and the next sample taken from this sub-grid will be designated A1-2. If a discrete sample is taken in addition to the composite sample, the discrete sample will retain the composite sampling number to denote the area from where it was collected. However, discrete sample names will include a '(D)' designation (for example A1-1(D)).

2.4 Soil Sampling Equipment and Procedures

Soil sampling locations will be selected in the field using the methodology described in Section 2.3. Soil samples will be collected at each location using steel hand tools, such as a small hand shovel, or a hand auger if conditions warrant. Soil sample locations with respect to the existing site survey will be recorded in the field logbook. The glass sample containers will be filled to the top with measures taken to reduce the potential for soil to remain in the threads of the plastic lid prior to being sealed to reduce the potential for migration of soil to or from the sample. After sample

containers are filled, they will immediately be sealed and processed for shipment to the laboratory.

2.5 Decontamination Procedures

Non-disposable sampling equipment, such as small tools, will be decontaminated after each use. The decontamination procedure will consist of the following steps:

- Equipment will be washed in a phosphate-free soap and water mixture;
- Equipment will be rinsed thoroughly in distilled water following washing; and
- Equipment will be rinsed again in distilled water.

Decontamination procedures will be done using three 5-gallon buckets with their respective wash/rinse solutions. Solutions will be transferred into 55-gallon drums following use. A rinse/wash solution will be transferred either when it becomes cloudy or after 10 hand tools have been decontaminated. The third rinsate solution may be sampled periodically and analyzed for PCB based on the soil sample results.

3. SAMPLE HANDLING

3.1 Introduction

Soil samples will be processed for shipment to the analytical laboratory as described in this section.

3.2 Sample Numbering System and Label

The sample numbering system is presented in Section 3.1. The sample identification number will be recorded in the field logbook, on the sample container, and on the chain-of-custody form. The corresponding coordinates with respect to the existing site survey will be recorded in the logbook for the sample locations.

3.3 Bottles and Preservatives

The containers are pre-cleaned and will not be rinsed prior to sample collection. Preservatives are not necessary for soil samples that will be analyzed for PCB (EPA Method 8082). Laboratory soil sample containers will be 4 ounce wide-mouth clear glass sample jars with screw-cap lids. The third rinsate solution, as described in Section 2.5, may be sampled daily and then analyzed for PCB based on the soil sample results. Rinsate samples, if any, will be collected in unpreserved, 1-liter amber glass bottles.

3.4 Sample Chain-of-Custody Records

Chain-of-custody records are used to document sample collection and shipment to the analytical laboratory. Sample shipments will be accompanied by a chain-of-custody record. Chain-of custody record(s) will be completed and sent with the samples in each shipment (i.e., each day). If multiple packages of samples are sent to a single laboratory on a single day, record(s) will be completed and sent with the samples for each cooler. The chain-of-custody record will describe the contents of each

shipment and maintain the custodial integrity of the samples. Generally, a sample is considered to be in someone's custody if it is either in someone's physical possession, in someone's view, locked up, or kept in a secured area that is restricted to authorized personnel. Until the samples are shipped, the custody of the samples will be the responsibility of the soil sampler. The Site leader or designee for the soil sampler will sign the chain-of-custody record. The Site leader or designee for the soil sampler will sign the 'relinquished by' box and note date and time on the record. Corrections on sample paperwork will be made by placing a single line through the mistake and initialing and dating the change. The correct information will be entered above, below, or after the mistake. The requested analysis will be noted on the chain-of-custody form. EPA Method 8082 will be used by the laboratory to analyze the samples for PCB.

3.5 Photographs

Photographs will be taken at areas of interest on Site. They will be taken as a supplement to information entered in the field logbook. When a photograph is taken, the following information will be written in the logbook or will be recorded in a separate field photography log:

- Time, date, location, and, if appropriate, weather conditions;
- Description of the subject photographed; and
- Name of person taking the photograph.

3.6 Labeling, Packaging, and Shipment

Samples will be labeled in a clear and precise way for proper identification in the field and for tracking in the laboratory. The samples for laboratory analyses will have pre-assigned, identifiable, and unique numbers. At a minimum, the sample labels will contain the following information: project name, date of collection, and analytical parameter(s).

Sample containers will be placed in a strong-outside shipping container such as a plastic cooler. Sample packaging procedures will include:

- Line the bottom of the cooler with bubble wrap to reduce the potential for breakage during shipment;
- Check screw caps for tightness;
- Check that sample labels are correct; and
- Separate glass sample containers to reduce the potential for breakage.

Samples will be placed in coolers with the appropriate chain-of-custody forms. Forms will be enclosed in a large plastic bag and affixed to the underside of the cooler lid. Empty space in the cooler will be filled with bubble wrap or styrofoam peanuts to reduce the potential for movement and breakage during shipment. Each cooler will be securely taped shut with nylon strapping tape before shipment. The DTSC will be notified a minimum of one week prior to sampling activities of the approximate sample collection and shipment schedule.

4. SOIL SAMPLE ANALYSIS

Soil samples will likely be analyzed by Advanced Technologies Laboratories, ATL, located in Signal Hill, California. ATL provided analytical testing in previous phases of the site remedial investigation. These laboratories may also subcontract certain analyses to other State certified laboratories. Each laboratory, and its analytical responsibilities, will be clearly indicated on documentation of sample results.

The resulting grid area composite samples and discrete samples will be analyzed for PCB using USEPA Method 8082. The remaining portions of the sub-grid samples and discrete samples will be archived pending analytical results of the composited and discrete samples.

5. SAMPLING WASTE MANAGEMENT PLAN

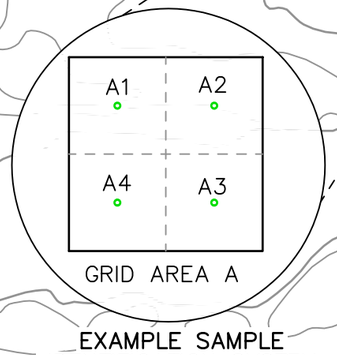
IDW will consist of decontamination residuals and portions of soil samples that are not analyzed by the laboratory. Decontamination solution will be stored inside the fenced area on the Site in a 55-gallon drum(s). The decontamination solution will be analyzed for PCB. Pending the results of the laboratory analysis, the decontamination solution will be disposed of accordingly. The analytical laboratory will be responsible for disposing of sample-related IDW generated during the sampling and analysis process.

FIGURE

BANKTON AVE.

GRAHAM ST.

FALKIRK LN.



EXAMPLE SAMPLE IDENTIFICATION SYSTEM

LEGEND

- FIELDSTONE PROPERTY BOUNDARY
- APPROXIMATE SOIL SAMPLING LOCATION
- SOIL SAMPLE SUB-GRID (50 FEET BY 50 FEET)
- SOIL SAMPLE GRID AREA (25 FEET BY 25 FEET)
- DISCRETE SAMPLING AREA
- APPROXIMATE EXCAVATION AREA (SOIL HAVING PCB IN EXCESS OF THE 0.25mg/kg CLEANUP LEVEL)

N

0 50 100

SCALE IN FEET

mg/kg – milligram per kilogram

GeoSyntec Consultants

APPROXIMATE REMOVAL ACTION SOIL SAMPLING LOCATIONS
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA

FIGURE NO.	2-1
PROJECT NO.	HR0653-01
DOCUMENT NO.	
DATE:	SEPTEMBER 2004

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APPENDIX D

QUALITY ASSURANCE PROJECT PLAN

QUALITY ASSURANCE PROJECT PLAN
FOR THE REMOVAL ACTION WORKPLAN
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA
DOCKET NO.: HSA-CO 01/02-154
CONSENT ORDER RESPONDENT:
HEARTHSIDE RESIDENTIAL CORP.

SUBMITTED TO:

STATE OF CALIFORNIA

Department of Toxic Substances Control

PREPARED BY:

GeoSyntec Consultants
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15 October 2004

QUALITY ASSURANCE PROJECT PLAN FOR THE REMOVAL ACTION WORKPLAN FIELDSTONE PROPERTY

TABLE OF CONTENTS

Page

TABLE OF CONTENTS (continued)

Page

FIGURE

1. INTRODUCTION

1.1 Terms of Reference

This Quality Assurance Project Plan (QAPP) was prepared by GeoSyntec Consultants (GeoSyntec) for the Removal Action (RA) at the Fieldstone Property (the Site) in Orange County, California. This QAPP is a component of the Removal Action Workplan (RAW), which was prepared by the staff of the United States Fish and Wildlife Service and the Department of Toxic Substances Control in accordance with Section 25323.1 of the California Health and Safety Code. T This QAPP addresses project organization and responsibilities with respect to the RA. This QAPP also provides data quality objectives and quality control procedures for sampling and analysis.

1.2 Project Background

The Fieldstone Property is an approximately 42-acre parcel located in an unincorporated area of Orange County adjacent to Huntington Beach, California. During the performance of an environmental assessment of adjacent property, known as the Bolsa Chica Lowland, samples were also collected at the Fieldstone Property for analysis. Polychlorinated biphenyls (PCB) have been detected in Site soil samples.

Following the notification of the appropriate agencies, the Site owner, Hearthside Residential Corp. (Hearthside), entered into a Consent Order with the Department of Toxic Substances Control (DTSC). Hearthside conducted an extensive Remedial Investigation (RI) of the Site, as required by the Consent Order. Based on historical and RI data, the DTSC is implementing a non-emergency RA to excavate and remove the approximately 2-acre area of the Site soil where samples with PCB concentrations in excess of the cleanup level, 0.25 mg/kg as PCB Aroclor 1260, have been collected. The Removal Action Workplan (RAW), prepared by DTSC and the U.S. Fish and Wildlife Service (USFWS), concluded that “excavation and off-site disposal” is the most appropriate removal action for the Site.

1.3 Remedial Investigation Workplan and QAPP Objectives

Refer to the RAW for a more complete description of the RA objectives. Soil sampling at the Site will be conducted according to the procedures outlined in Section 10.5 and Appendix C of the RAW. The objective of this QAPP is to describe procedures for validation of project data. The procedures are intended to yield data that are suitable for use in evaluating the PCB concentration, if any, in residual soils as the RA progresses. Ultimately, the soil samples that are collected as the RA progresses will yield PCB results that are less than 0.25 mg/kg, the prescribed cleanup level.

1.4 Organization of the Document

This QAPP includes the following sections:

- Section 2, *Project Organization and Responsibilities*, provides a summary of the roles of key individuals involved in the project;
- Section 3, *Data Management and Reporting*, describes the design for the data collection and reporting processes;
- Section 4, *Sampling Locations and Procedures*, provides a brief summary of the field sampling activities;
- Section 5, *Sample Custody and Holding Times*, addresses the holding and transfer of soil samples;
- Section 6, *Analytical Procedures*, outlines the analytical procedures that will be used to generate soil sample data;
- Section 7, *Calibration Procedures and Frequency*, describes the procedures that will be used to calibrate data collection tools;
- Section 8, *Quality Control Samples*, provides a description of the quality control samples that will be used;

- Section 9, *Corrective Procedures and Frequency*, describes procedures for maximizing data collection efforts;

- Section 10, *Preventative Maintenance*, provides a description of techniques that prevent loss of time or delay due to malfunctions; and

- Section 11, *Data Reduction, Validation, and Reporting*, describes the methods for effectively presenting and analyzing the data.

A figure is included at the end of this document.

2. PROJECT ORGANIZATION AND RESPONSIBILITIES

2.1 General

The organization chart for this project is presented as Figure 2-1. DTSC has regulatory oversight over the RA and will review RA implementation documentation. The California State Lands Commission (SLC) and the USFWS will implement soil excavation and removal activities. Ray Pacini of Hearthside is the Project Coordinator, and Eric Smalstig, P.E., of GeoSyntec is the Project Engineer for this Site. GeoSyntec, on behalf of Hearthside, will conduct soil sampling and air monitoring activities.

2.2 Field Sampling

GeoSyntec personnel will perform the field sampling activities outlined in Section 10.5 and Appendix C of the RAW. The tasks that will be performed during field sampling include:

- marking sample locations;
- soil sampling;
- equipment and PPE decontamination;
- maintaining a field logbook to record sampling activities; and
- sample documentation and transport arrangements.

GeoSyntec personnel will also conduct air monitoring, which is described in Section 10.4 of the RAW. Air monitoring tasks include:

- using personal air monitoring devices in the work zone;
- using stationary air monitoring devices at upwind and downwind perimeter locations;
- using dust control measures, as appropriate;
- calibrating air monitoring devices; and
- air monitoring sample documentation and transport arrangements.

2.3 Laboratory Analysis

Laboratory analyses will include analyzing soil samples that are collected from the excavation area and dust samples collected by air monitoring devices. Laboratory analyses will be performed by a State certified analytical laboratory (for soil samples, likely Advanced Technologies Laboratories, ATL, located in Signal Hill, California; and for dust samples, likely Columbia Analytical Services, located in Simi Valley, California) and their subcontractors. ATL provided analytical testing in previous phases of the site remedial investigation. Columbia provides air quality services for fugitive dust monitoring. Both laboratories possess current State of California certifications. These laboratories may also subcontract certain analyses to other State certified laboratories. Each laboratory, and its analytical responsibilities, will be clearly indicated on documentation of sample results.

3. DATA MANAGEMENT AND REPORTING

3.1 General

This section contains information about procedures to be used for managing and reporting data from the analyses of the samples. This section also describes how data will be evaluated to support RA decisions.

3.2 Data Management

3.2.1 Data Quality Objectives

DQOs are qualitative and quantitative statements derived from the outputs of the initial project strategy discussions and steps of the DQO Process that:

- Clarify the study objective;
- Define the most appropriate type of data to collect;
- Determine the most appropriate conditions from which to collect the data; and
- Provide guidance on tolerable limits on decision errors that will be used as the basis for establishing the quantity and quality of data needed to support the decision.

The DQOs are then used to develop a scientific and resource-effective data collection design. According to analysis of historical data and Site conditions, the following conclusions were reached to address the DQO definition presented above:

- The objective of the RA is to excavate and remove soil with PCB concentrations that exceed the cleanup level, 0.25 mg/kg of PCB as Aroclor 1260;
- PCB Aroclor 1260 is the primary chemical of concern;

- Soil will be excavated from the approximately 2-acre Area of Concern to depths ranging up to approximately 5 feet below ground surface (ft bgs) in a limited portion of Area of Concern; and

- This QAPP describes procedures for reducing the potential for decision-making errors.

3.2.2 Remedial Investigation Data Quality Objective Process

This section presents the data quality process for decisions during the RA. The seven DQO process steps are described with the corresponding RA information below:

- Step 1: State the Problem:

  – Post-excavation soil sample data are needed to evaluate whether residual PCB concentrations exceed the cleanup level, 0.25 mg/kg as PCB Aroclor 1260.

- Step 2: Identify the Decision:

  – Decide whether excavation and removal of soil has achieved the cleanup goal or if excavation and removal should continue.

- Step 3: Identify Inputs to the Decision:

  – Soil samples will be collected from the floor of and adjacent to the excavation area and analyzed for PCB.

- Step 4: Define the Study Boundaries:

- Historical and RI data show that the Area of Concern is approximately 2 acres in size, located in the northeastern portion of the Site. Soil samples with PCB concentrations in excess of the cleanup level have been collected from up to approximately 5 ft bgs in a limited portion of the Area of Concern.

- Step 5: Develop a Decision Rule:

  - If post-excavation sample results from an area show that residual PCB concentrations are in excess of 0.25 mg/kg, the RA will continue in that area. Excavation and removal will cease in an area when soil sample results do not exceed the PCB cleanup level.

- Step 6: Specify Tolerable Limits on Decision Errors:

  - Based on the data from the Area of Concern and the existence of a cleanup level, sample results must comply with the cleanup level for excavation to cease.

  - A composite sample or discrete sample with a PCB concentration of greater than 0.25 mg/kg will lead to more excavation and removal of Site soil in the area of respective sample location.

  - A composite or discrete sample with a PCB concentration of 0.25 mg/kg complies with the cleanup level. However, the composite sample may have been collected from four discrete locations that were not in compliance. As an example, one of the discrete location samples may be at 1.0 mg/kg, while the rest do not contain detectable PCB concentrations. This is an acceptable result because of the large amount of the planned post-excavation samples that will represent relatively small areas, the 1.0 mg/kg Toxic Substances Control Act PCB

concentration thresholds that apply to the Site, and future Site use.

– Residual PCB concentrations in the composite and discrete samples that are below the cleanup level will suggest that more soil was excavated than needed. This is a tolerable scenario.

- Step 7: Optimize the Design for Obtaining Data:

  – The sampling and analyses plan has been developed to efficiently provide usable Site data. Components of the design include:

    - sampling in accordance with EPA SW-846 procedures;
    - using composite sampling to evaluate four discrete areas within a composite area;
    - supplementing the composite sampling with the discrete sampling in the most PCB-impacted portion (approximately 0.2 acres) of the Area of Concern; and
    - instituting data validation procedures.

3.3 Data Reporting

PCB concentration data in soil samples will be used in the RA. For soil samples analyzed for PCBs using EPA Method 8082, the laboratories can achieve a practical quantitation limit (PQL) of approximately 0.033 mg/kg. In the event of sample interference in discrete samples, an upper bound for the quantitation limit for acceptance of data as valid for purposes of this RA will be set at the cleanup level, 0.25 mg/kg. In the event of sample interference in composite samples, an upper bound for the quantitation limit for acceptance of data as valid for purposes of this RI will be

set at 0.063 mg/kg of PCB in soil. This concentration represents one-fourth of the cleanup level for the four to one composites. If the 0.63 mg/kg limit is not possible, the discrete samples that comprised the composite will be analyzed separately. If the reporting limit requirements are still not met, re-sampling may be needed. Analytical laboratory reports for the RA soil samples will be accessible to the DTSC.

4. SAMPLING LOCATIONS AND PROCEDURES

4.1 Sampling Locations

The excavated area will be divided in a grid of areas approximately 50 ft by 50 ft. The grid areas will be visually subdivided into four smaller 25 ft by 25 ft subgrids. A sample will be collected from the approximate center of each subgrid. The four subgrid samples collected per 50 ft by 50 ft area will be composited in equal volume portions and homogenized. The compositing and homogenization procedures will be performed by the analytical laboratory. Discrete samples will also be collected from the approximately 0.2-acre area where the highest PCB concentrations have been found. The resulting grid area composite samples and discrete samples will be analyzed for PCB using USEPA Method 8082. The remaining portions of the subgrid samples will be archived pending analytical results of the composited sample. Subgrid sample locations will be marked at the time of sampling and coordinates will be documented relative to the existing site survey. One subgrid duplicate sample will be collected per 20 subgrid samples and analyzed for PCB. Additionally, the analytical laboratory will be instructed to duplicate the composting, homogenization, and analysis procedures for two to three grid area composite samples. The duplicate results for those two to there areas will be compared.

4.2 Sampling Procedures

Hand tools will be used to collect samples from the upper few inches of soil within and adjacent to the excavation area. Soil samples will be placed in glass jars and processed for shipment to the analytical laboratory.

4.3 Sampling Duration

If the laboratory result shows a residual PCB concentration greater than 0.25 mg/kg, an additional layer of soil (3 inches or greater) will be removed from the floor of the 50 ft by 50 ft grid and the post-excavation verification sampling procedure described previously will be repeated. This process will be continued until the sample

results do not exceed the cleanup level. The process is expected to be conducted over a period of approximately two to three months.

5. SAMPLE CUSTODY AND HOLDING TIMES

Sample custody will be recorded on the chain-of-custody form. Special notices, if any, will be recorded on that form, and a copy will accompany the laboratories' analytical report. Samples are anticipated to be delivered to the laboratory for analysis within three days of the time that they are collected. Soil samples may be held for up to fourteen days prior to PCB analysis using EPA Method 8082. However, once PCB is extracted from the soil sample, the extract can be held for up to forty days prior to EPA Method 8082 analysis.

6. ANALYTICAL PROCEDURES

Soil samples will be analyzed for PCB using EPA Method 8082. The total PCB result will be reported as will concentrations of certain PCB Aroclor(s), including Aroclor 1260. The laboratories selected for this work are certified to perform the requested analyses. The laboratories will strictly adhere to state and federal requirements of the methods requested.

7. CALIBRATION PROCEDURES AND FREQUENCY

Laboratories will perform instrument calibration according to instrumentation specification and method requirements. Calibration, such as five-point calibration, of the equipment used to perform the soil sample analysis according to EPA Method 8082 will be conducted based on method performance. The equipment will be calibrated using internal standards, and one of the standards will be at or below the reporting limit. The calibrations should be checked by the laboratory at least daily and the results noted in the analytical report. Deviations from the expected calibration range will be specially noted in the data narrative.

8. QUALITY CONTROL SAMPLES

8.1 General

Duplicate samples will be collected for quality control. The criteria for acceptable data quality are described in the following sections.

8.2 Duplicate Samples

Two to three composite samples will be split into two aliquots and analyzed by the laboratory. Discrete samples may also be duplicated and analyzed. The results will be compared using the RPD measure for precision (equation 1). Samples may be re-evaluated if the RPD is greater than 20%.

$$RPD = \frac{S - D}{\left(\frac{S + D}{2}\right)} * 100\% \qquad (1)$$

Using equation 1, the RPD is calculated for S, the sample result, and D, the duplicate sample result.

DTSC and/or Bolsa Chica Steering Committee representatives may also collect separate samples as the RA progresses. Results from those samples will be included with the other data upon completion of the RA, but will not be subject to the 20% criterion.

9. CORRECTIVE ACTIONS

9.1 General

Overall, the data set will be considered valid if 80% of the data falls within laboratory-specified QA criteria, as well as the QC criteria specified in Section 8. Where possible, corrective actions will be taken to improve data quality based on QA/QC results. Corrective actions in the field relate to inspections of equipment, procedures, and field data. Corrective actions may also relate to laboratory analysis.

9.2 Soil Sampling Corrective Actions

Corrective actions in the field may involve one or more of the following:

- decommissioning field equipment based on ineffectiveness, data review anomalies associated with the equipment, or signs of contamination; and
- re-sampling.

Corrective actions made in the field will be noted in the field logbook.

9.3 Laboratory Sample Receiving

The laboratory will review the incoming samples to verify that they meet sample container and documentation requirements. The laboratory may request re-sampling if the samples are not received according to requirements.

9.4 Sample Holding Times

The laboratory will notify the Project Engineer if samples exceed the holding times presented in Section 5, and the sampling locations may be re-sampled.

9.5 Instrument Calibration

An analytical instrument has the potential to be outside of calibration limits during sample analysis. The instrument will be recalibrated and/or demonstrated prior to samples being reanalyzed.

9.6 Method QC

Method QC procedures will meet requirements specified by the method or the DQO, or else be subject to corrective action by the laboratory.

9.7 Detection and Dilutions

If detection limits or dilution factors prevent meeting the DQO, the laboratory will contact the Project Engineer. Re-analysis or re-sampling may be justified based on the DQO.

9.8 Data Interpretation

During data review, the Project Engineer may encounter results that do not correlate well with expectations, with other results, and with results from other methods performed on the same samples. This may trigger inquiries to raw data, such as chromatograms, that are not normally provided with the results. If laboratory duplicates do not show acceptable precision, procedures and records will be reviewed. Re-ampling may be necessary if the data set falls below the 80% validated criteria.

9.9 Notification of Noncompliance

The Project Engineer will inquire into problems associated with the data. The DTSC will be consulted regarding problems with data that are not resolved by the Project Engineer.

10. PREVENTATIVE MAINTENANCE

10.1 General

Preventative maintenance activities are performed to prevent loss of data due to malfunctions or delay. Critical functions are identified for field and laboratory purposes.

10.2 Field Activities

Critical functions include:

- carrying extra sample containers; and
- having a backup plan for acquiring necessary items in case of malfunction (i.e., rental agencies for broken or malfunctioning equipment).

10.3 Laboratory Activities

Critical functions are included in the laboratory QAPP, and may include:

- having emergency analytical equipment service capabilities;
- having backup instrumentation;
- using another certified laboratory; and/or
- following routine maintenance schedules.

11. DATA REDUCTION, VALIDATION, AND REPORTING

The laboratory will review the data according to its QA/QC Plan and internal QAPP. The laboratory data will be reviewed by project personnel with respect to the DQO. Inquiries into the data may be made and the data will be analyzed according to this QAPP. The results provided by the laboratory that meet QA/QC review and satisfy the DQO for this project will be reported in the RI Report. Additionally, descriptions of rejected data or data quality issues will be included in the RI Report.

FIGURE

FIGURE 2-1

REMOVAL ACTION ORGANIZATION CHART
FIELDSTONE PROPERTY
ORANGE COUNTY, CALIFORNIA